UCSD

2004-2005 General Catalog

Celebrating the Seussentennial

Dr. Seuss's 100th Birthday

UCSD University of California, San Diego

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Correspondence Directory

Campus Directory Information		(858) 534-2230
UNDERGRADUATE		
Admissions	Office of Admissions and Relations with Schools	Building 301, University Center, 0021, (858) 534-4831
Campus Tours	Office of Admissions and Relations with Schools	Price Center Theater, 0075, (858) 822-1455
Educational Opportunity Program (EOP)	Office of Admissions and Relations with Schools	Building 301, University Center, 0021, (858) 534-4831
Financial Aids (Loans and Grants)	Financial Aid Office	Building 201, University Center, 0013, (858) 534-4480
International Students' Affairs	Office of International Education	International Center, 0018, (858) 534-3730
Housing		
On-Campus	Housing Administration	Trailer 310, University Center, 0041, (858) 534-4010
Off-Campus	Office of Housing Services	Student Center Building A, 0309, (858) 534-3670
Part-Time Employment	Career Services Center	Career Services Center, 0330, (858) 534-4500
On-Campus		
Off-Campus		
Provosts		
Eleanor Roosevelt College	Building 412	University Center, 0069, (858) 534-2235
Muir College	H&SS Building, Room 2126	Muir Campus, 0106, (858) 534-3583
Revelle College	Revelle Provost Building	Revelle Campus, 0321, (858) 534-3262
Thurgood Marshall College	Thurgood Marshall College Admin. Building	Marshall Campus, 0509, (858) 534-4002
Earl Warren College	Literature Building, Room 3210	Warren Campus, 0422, (858) 534-4350
Sixth College	Building 965	University Center, 0054, (858) 822-5955
Registration	Admissions & Registrar	Building 301, University Center, 0021R, (858) 534-3150
Residence Status	Admissions & Registrar	Building 301, University Center, 0021R, (858) 534-4586
Scholarships	Financial Aid Office	Building 201, University Center, 0013, (858) 534-4480
Student Activities	University Events Office	Price Center, 0078, (858) 534-4090
Transfer Student Services	Office of Admissions and Relations with Schools	Building 301, University Center, 0021, (858) 534-4831
GRADUATE		
Dean of Graduate Studies and Research	Office of Graduate Studies and Research	Building 518, Eleanor Roosevelt College, 0003, (858) 534-3555
Admissions	(Address the appropriate department of instruction.)	
Affirmative Action	Office of Graduate Studies and Research	Building 518, Eleanor Roosevelt College, 0003, (858) 534-3871
Fellowships	Office of Graduate Studies and Research	Building 518, Eleanor Roosevelt College, 0003, (858) 534-3556
Financial Aids (Loans and Grants)	Financial Aid Office	Building 201, University Center, 0013, (858) 534-3807
Graduate Women's Program	Office of Graduate Studies and Research	Building 518, Eleanor Roosevelt College, 0003, (858) 534-3555
Housing	Graduate Apartments Residential Apartments Office	9224 B Regents Road, 0907, (858) 534-2952
Teaching and Research Assistantships	(Address the appropriate department of instruction.)	
SCHOOL OF MEDICINE		
Admissions	Admissions Office	162 Medical Teaching Facility, 0621, (858) 534-3880

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Contents

NOTE: While efforts have been made to assure the accuracy of statements in this catalog, it must be understood that all courses, course descriptions, designations of instructors, and all curricular and degree requirements contained herein are subject to change or elimination without notice. Students should consult the appropriate department, school, college, or graduate division for current information, as well as for any special rules or requirements imposed by the department, school, college, or graduate division. UCSD on the World Wide Web: http://www.ucsd.edu

The departmental Web sites referenced in this catalog are maintained by independent operators and do not necessarily reflect approved curricular and course information.

Back cover photo by Michele Humphrey.

Academic and Administrative Calendar, 2004–2005

Fall Quarter, 2004

Fall quarter begins	Monday, September 20
Instruction begins	Thursday, September 23
Veteran's Day	Thursday, November 11
Thanksgiving holiday	Thursday–Friday, November 25–26
Instruction ends	Friday, December 3
Final exams	Monday–Saturday, December 6–11
Fall quarter ends	Saturday, December 11
Christmas holidays	Thursday–Friday, December 23–24
New Year holidays	Thursday–Friday, December 30–31

Winter Quarter, 2005

Winter quarter begins	Monday, January 3
Instruction begins	Monday, January 3
Martin Luther King, Jr. holiday	Monday, January 17
Presidents' Day holiday	Monday, February 21
Instruction ends	Friday, March 11
Final exams	Monday–Saturday, March 14–19
Winter quarter ends	Saturday, March 19

Spring Quarter, 2005

Spring quarter begins	Thursday, March 24
Cesar Chavez holiday	Friday, March 25
Instruction begins	Monday, March 28
Memorial Day holiday observance	Monday, May 30
Instruction ends	Friday, June 3
Final exams	Monday–Friday, June 6–10
Spring quarter ends	Friday, June 10
Commencement	Saturday/Sunday, June 11/12

Summer Sessions, 2005

Summer Session I begins	Monday, June 27
Independence Day holiday	Monday, July 4
Summer Session I ends	Saturday, July 30
Summer Session II begins	Monday, August 1
Summer Session II ends	Saturday, September 3
Labor Day holiday	Monday, September 5

Undergraduate Admission Information and Enrollment Deadlines

	Fall Quarter 2004	Winter Quarter 2005	Spring Quarter 2005
ADMISSION	**Nov. 1–30, '03**	***July 1–31, '04**	***Oct. 1–31, '04**
Filing period for application materials			
PRIORITY DEADLINE FOR APPLICATIONS FOR FINANCIAL AID	March 2, '04	March 2, '04	March 2, '04
ENROLLMENT	May 5–Sept. 20	Nov. 3–Dec. 17	Feb. 9–Mar. 18
Students may enroll by telephone, via StudentLink, or in person after their appointment begins.			
Students may use add cards to enroll in restricted courses.			
Students may pay fees by e-check on StudentLink or in person at Cashier's Office after enrolling.			
STUDENT HEALTH INSURANCE WAIVER PERIOD BEGINS (ALL STUDENTS)	Aug. 1	Nov. 22	Feb. 18
BILLING STATEMENTS MAILED TO ENROLLED STUDENTS	Aug. 23	Nov. 30	March 7
NEW STUDENT ENROLLMENT	June 14–Sept. 20	Dec. 6–10	March 14–18
DEADLINE DAY TO ENROLL WITHOUT LATE FEES			
Students who have not enrolled will be assessed $100 in late fees. ($50 late enrollment fee and $50 late payment fee)			
Continuing Undergraduates	Sept. 17	Dec. 17	March 18
New Undergraduates	Sept. 17	Dec. 17	March 18
QUARTER BEGINS	**Sept. 20**	**Jan. 3**	**March 24**
LAST DAY FOR STUDENTS WHO MET ENROLLMENT DEADLINE TO PAY REGISTRATION FEES WITHOUT $50 LATE PAYMENT FEE			
Continuing Undergraduates	Sept. 17	Dec. 17	March 18
New Undergraduates	Oct. 1	Jan. 7	April 1
LAST DAY FOR STUDENTS ON FINANCIAL AID, SCHOLARSHIPS, AND FULL FEE WAIVERS TO NOTIFY THE CAMPUS IF NOT ATTENDING	**Oct. 1**	**Jan. 7**	**April 1**
LATE REGISTRATION PERIOD	Sept. 11–Oct. 8	Dec. 23–Jan. 14	Mar. 19–Apr. 8
INSTRUCTION BEGINS	**Sept. 23**	**Jan. 3**	**March 28**
ADD/CHANGE/DROP PERIOD	Sept. 23–Oct. 8	Jan. 3–14	March 28–Apr. 8
DEADLINE TO REQUEST WAIVER OF MANDATORY HEALTH INSURANCE FEE	Oct. 8	Jan. 14	April 8
Undergraduates	Sept. 20	Jan. 5	March 24
Graduates (end of first week of instruction)	Oct. 1	Jan. 7	April 1
DEADLINE DAY TO PAY REGISTRATION FEES TO AVOID CANCELLATION OF CLASSES	Oct. 8	Jan. 14	April 8
FINAL DAY TO ADD COURSES	Oct. 8	Jan. 14	April 8
LAST DAY TO APPLY FOR PART-TIME STATUS	Oct. 8	Jan. 14	April 8
CHANGE/DROP PERIOD CONTINUES	Oct. 9–Nov. 29	Jan. 15–Mar. 4	Apr. 9–May 27
Last day to drop without "W."	Oct. 22	Jan. 28	April 22
Last day to change grading option, change variable units.	Oct. 22	Jan. 28	April 22
Last day to drop with "W" or final grade must be assigned.	Nov. 29	March 4	May 27
INSTRUCTION ENDS	**Dec. 3**	**March 11**	**June 3**
FINAL EXAMINATIONS	Dec. 6–11	March 14–19	June 6–10
FINAL DAY TO FILE "REQUEST TO RECEIVE GRADE INCOMPLETE"	Dec. 13	March 21	June 13
QUARTER ENDS	**Dec. 11**	**March 19**	**June 10**
COMMENCEMENT			June 11/12

* If open—contact Undergraduate Admissions for details, (858) 534-4831. Students applying for winter or spring quarter admission and also applying for financial aid are urged to apply early as mid year funds for winter and spring applicants may be limited to only bank loans, Federal Pell Grant, and/or Renewal Cal Grant.

Graduate Admission Information and Enrollment Deadlines

ADMISSION

Applicants should check with their prospective departments for deadline dates, although most have January 15, 2005, deadlines.

	FALL QUARTER 2005
GENERAL ADMISSIONS WITH FELLOWSHIP APPLICATIONS	
Deadline date for filing application materials	Jan. 15, 2005
Notice of awards	April 1, 2005
Acceptance of awards	April 15, 2005
DEADLINE FOR APPLICATIONS FOR FINANCIAL AID	March 2, 2005

GRADUATE ENROLLMENT DEADLINES	FALL QUARTER 2004	WINTER QUARTER 2005	SPRING QUARTER 2005
OPEN ENROLLMENT: CONTINUING STUDENTS	May 5–Sept. 20	Nov. 3–Dec. 22	Feb. 9–Mar. 18
NEW STUDENT ENROLLMENT	June 14–Sept. 17	Dec. 6–10	Mar. 13–17
APPLICATION FOR INTERCAMPUS EXCHANGE PROGRAM	Aug. 20	Dec. 3	Feb. 25
FILING APPROVED LEAVE OF ABSENCE	Oct. 8	Jan. 14	April 8
DEADLINE DAY TO ENROLL WITHOUT LATE FEES	Sept. 10	Dec. 17	March 18
QUARTER BEGINS	**Sept. 20**	**Jan. 3**	**March 24**
INSTRUCTION BEGINS	**Sept. 23**	**Jan. 3**	**March 28**
New and Readmitted Graduate Deadline to enroll and pay registration fees without payment of late fees	Oct. 1	Jan. 14	April 8
LATE REGISTRATION			
Last day for continuing students who met enrollment deadline to pay registration fees without $50 late payment fee. Enrollment and payment of fees after this date requires payment of $50 for late enrollment and $50 for late payment of fees, totaling $100.	Sept. 10	Dec. 17	March 18
FINAL DAY TO ADD OR DROP	Oct. 8	Jan. 14	April 8
DEADLINE TO CHANGE GRADING OPTION	Oct. 22	Jan. 28	April 22
DEADLINE FOR DROPPING CLASSES WITHOUT "W" APPEARING ON THE TRANSCRIPT	Oct. 22	Jan. 28	April 22
MASTER'S DEGREE			
Filing for advancement to candidacy with completion in same quarter	Oct. 8	Jan. 14	April 8
Filing approved thesis	Dec. 11	March 19	June 10
DOCTOR OF PHILOSOPHY DEGREE			
Filing draft dissertation with doctoral committee for current quarter completion	Nov. 5	Feb. 11	May 6
Filing approved dissertation and related materials	Dec. 11	March 19	June 10
DROPPING CLASSES WITHOUT PENALTY OF "F" GRADE	Nov. 29	March 4	May 27
INSTRUCTION ENDS	**Dec. 3**	**March 11**	**June 3**
FINAL EXAMINATIONS	Dec. 6–11	March 14–19	June 6–10
REMOVING INCOMPLETE GRADES (I) ASSIGNED IN PRIOR QUARTER	Dec. 3	March 11	June 3
QUARTER ENDS	**Dec. 11**	**March 19**	**June 10**
COMMENCEMENT			June 11/12
COMPLETION OF REQUIREMENTS			
Final date for completion of all requirements for degrees to be awarded at end of quarter	Dec. 11	March 19	June 10

Dates are subject to change; see quarterly schedule of classes for changes.

Introduction

History

UCSD is one of the ten campuses which make up the University of California system. The other campuses are located in Berkeley, Davis, San Francisco, Santa Cruz, Santa Barbara, Riverside, Los Angeles, Irvine, and Merced. Each has its own distinct academic and social character, and each offers programs and facilities which set it off from the others.

As a member of the ten-campus family of the University of California, UCSD is a university in scale and scope. Graduate and undergraduate programs, offered in a wide range of disciplines, lead to the bachelor's, master's, M.D., Ph.D., and PharmD. degrees. UCSD's Scripps Institution of Oceanography is internationally renowned, and UCSD's School of Medicine has won national acclaim for excellence. UCSD's Graduate School of International Relations and Pacific Studies is the only school of international affairs in the UC system. The UCSD School of Pharmacy and Pharmaceutical Sciences enrolled its charter class in 2002, and the Rady School of Management will enroll Executive MBA students in 2004 and full-time students in fall 2005. At both the undergraduate and graduate levels, UCSD's curricula and programs have been highly ranked in recent surveys of American higher education.

UCSD enrolled its first undergraduates in 1964. Nevertheless, the campus can trace its origins in this area as far back as the late 1800s. At that time, zoologists on the Berkeley campus, seeking a suitable location for a marine field station, found La Jolla a very desirable site. The facility they established became a part of the University of California in 1912 and was eventually named the Scripps Institution of Oceanography. In the late 1950s, when the Regents of the University of California decided to situate a general campus in the San Diego region, the Scripps Institution formed the nucleus of the new campus.

Today UCSD is recognized throughout the academic world for its faculty and for its graduate and undergraduate programs. The faculty now includes nine Nobel laureates (four of whom hold joint appointments with the nearby Salk Institute); six recipients of the National Medal of Science; one winner of the Pulitzer Prize; sixty-eight members of the National Academy of Sciences; eighty-one Fellows of the American Academy of Arts and Sciences; fourteen Fellows of the American Philosophical Society; eight fellows of the Econometric Society; fifteen members of the National Academy of Engineering; six members of the International Academy of Astronautics; twenty-two members of the Institute of Medicine; and two members of the National Academy of Education.

UCSD houses a chapter of Phi Beta Kappa, the best-known honor society for the liberal arts and sciences in America. The campus is one of 265 four-year institutions selected for this distinction since the society was founded in 1776, and more than 200 current faculty and staff are members.

UCSD is a member of the Western Association of Schools and Colleges (WASC) and is fully accredited by the Senior College Commission of WASC. WASC is located at 985 Atlantic Avenue, Suite 100, Alameda, CA 94501, and may be reached at (510) 748-9001 or by fax at (510) 748-9797.

University and Community

There are certain facts about UCSD to consider in making your choice. Among them are:

- UCSD, a four-year undergraduate campus, is also a full-fledged graduate and research institution. UCSD faculty and scholars are continually involved in research and developmental projects that put this campus on the cutting edge of science, technology, and the arts and humanities.
- San Diego has become one of America's major centers for high-technology electronics and biomedical industries. Students concentrating on sciences or engineering are actively sought by these industries to fill summer jobs and career positions. Off-campus internships also are available to UCSD students in all fields of study.
- UCSD is recognized nationally as a major center for the arts and humanities, including music and theater.
- Undergraduates are offered opportunities to participate in certain research projects conducted by UCSD faculty. A number of UCSD undergraduates have developed computer skills that have led to their employment by leading computer manufacturers, and still others have gone on to form their own software enterprises as a direct result of their UCSD training.
- UCSD's unique small-college structure encourages undergraduates to play a more active role in student government, social life, and athletics than is generally open to them in other major universities. Opportunities for involvement in student governance are especially strong as there are student governing bodies at the campus level as well as within the six individual colleges.
- Campus athletic facilities include the Recreational and Intramural Athletic Center (RIMAC), two gymnasiums, two swimming pools, and numerous tennis and handball courts. The university's recreational and intramural athletic programs are among the most varied and extensive in the nation today.

Major Fields of Study

UCSD offers a wide variety of nationally recognized majors in a broad array of fields, summarized on page 13. (For a listing of graduate programs, refer to the section of this catalog titled "Graduate Studies.")

The academic departments of UCSD are listed on page 12. Details and requirements of the various individual courses are found in the "Courses, Curricula, and Programs of Instruction" section.

UCSD has limited the number of its academic departments. For example, there is only one Department of Literature. This system has proved especially valuable to undergraduates who choose to avoid overspecialization early in their studies.

A number of special, individually oriented programs use the combined resources of two or more departments. Among these are Chinese Studies, Classical Studies, Computing and the Arts, Critical Gender Studies, Earth Sciences, Environmental Systems, Human Development, German Studies, International Studies, Italian Studies, Japanese Studies, Judaic Studies, Latin American Studies, Study of Religion, Russian and Soviet Studies, the Teacher Education

Program, Third World Studies, and Urban Studies and Planning.

Engineering students may choose from a number of majors in the Department of Bioengineering (BE), the Department of Computer Science and Engineering (CSE), the Department of Electrical and Computer Engineering (ECE), the Department of Mechanical and Aerospace Engineering (MAE) or the Department of Structural Engineering (SE). All five departments seek to educate the engineer of tomorrow.

Undergraduates interested in premedicine and prelaw majors should note that a variety of departments can serve their needs. For premed students, the common choices are biology, chemistry, psychology, and bioengineering. Some students are electing double majors or are combining nontraditional majors with science majors. For prelaw students, nearly any undergraduate major will qualify a student for admission to a law school.

Should you need help in deciding on a major, many UCSD professionals are available to aid you. Among them are the deans of academic advising in the provosts' offices of the six colleges, faculty members, and departmental advisers. Additional specialists in Career Services Center and in Psychological and Counseling Services are available to help you appraise your personal aptitudes.

Summer Session

UCSD offers a Summer Session consisting of courses selected from the regular undergraduate curriculum and taught by UCSD faculty. In addition, Summer Session provides special educational opportunities not easily available during other quarters.

The Summer Session Program is open to UCSD students, students of other colleges and universities, qualified high school seniors, and the general public. Credit courses for selected professionals, such as teachers and engineers, are also offered.

Summer Session catalogs and registration forms are available in mid-March of each year. UCSD students may enroll via WebReg, http://studentlink.ucsd.edu. For free copies write to UCSD Summer Session, 9500 Gilman Dr., Dept. 0179, La Jolla, CA 92093-0179; or call (858) 534-4364; or send email to: summer@ucsd.edu.

What UCSD Does NOT Offer

Although the range and variety of programs offered at UCSD are very wide, there are certain disciplines which are not available on this campus. In some instances, the absence of a particular program reflects the academic philosophy of the UCSD campus and its faculty. In others, the absence of a curriculum is temporary, awaiting the availability of funds, personnel, or facilities before a program can be offered. In still others, programs have not been included which would, in the university's judgment, unnecessarily duplicate comparable offerings on other UC campuses or at other institutions.

Among undergraduate majors currently not available at UCSD are:

1. Business.
2. Oceanography. Although UCSD does not offer an undergraduate major in oceanography, some marine science courses are offered in the Division of Biology. Students planning to pursue oceanography at the graduate level may select from a large number of undergraduate courses in the physical, biological, and earth sciences to build a firm foundation for later graduate work. Graduate-level work in oceanography is offered by the Scripps Institution of Oceanography.
3. Nursing.
4. Industrial Arts.
5. Journalism. Although no major in journalism is offered, the Department of Literature offers a major in writing that can emphasize journalistic writing, and the development of writing skills is stressed in many disciplines. Many courses offered in the humanities and social sciences will provide the kind of broad-based preparation needed by practicing journalists. Several student newspapers are published on campus, providing ample "laboratory" opportunities for students to practice journalism.
6. Geography.
7. Physical Education. Note: UCSD does not offer athletic scholarships, and there is no intercollegiate football team at UCSD.

The Colleges of UCSD

UCSD undergraduates enjoy the benefits of a great university without the disadvantages of bigness found in many of today's mega-universities. The master plan conceived by UCSD's planners borrowed from the Oxford and Cambridge concept to provide a family of colleges, each with its own special academic and social flavor. UCSD's students gain a sense of belonging through affiliation with one of the campus's semiautonomous colleges.

There are six colleges: Revelle, John Muir, Thurgood Marshall, Earl Warren, Eleanor Roosevelt, and Sixth College. Each is independent, yet all are interrelated: all university academic and support facilities are available to all students, regardless of their college affiliation.

Each college has its own educational philosophies and traditions, its own set of general-education requirements, and its own administrative and advising staff. The objective is to give students and faculty the advantages of a small, liberal arts college combined with the best features of a major university.

Students applying to UCSD should select a college in order of their preference.

Details regarding the individual colleges are given in the "Choosing a College at UCSD" section of the catalog.

Recreation at UCSD

UCSD's undergraduate colleges are situated on a parklike site at La Jolla. La Jolla has some of the finest beaches and coves, art galleries, and other attractions in the nation.

Much of UCSD's recreational and social life centers on the waterfront, with surfing, SCUBA diving, and beach activities among the favorite diversions of UCSD students. Throughout the area, students find a variety of amusements, ranging from the small-town atmosphere of waterfront Del Mar to the primitive wilderness of Mexico's Baja California peninsula.

The city of San Diego, some twelve miles south of the campus, offers a wide range of recreational opportunities, including Old Town (California's birthplace), Sea World on Mission Bay, and the world-famous San Diego Zoo and Wild Animal Park. A year-round calendar of major league sporting events is offered in the city's Sports Arena and in San Diego Qualcomm Stadium.

There are numerous theaters in San Diego. A year-round program of contemporary and classical professional theater may be enjoyed in the Old Globe and the adjacent Cassius Carter Centre Stage, and special summer theater fare is featured on the park's outdoor Festival Stage.

On-campus entertainment includes a year-round series of movies and cultural programs, dances, chamber music, and rock-band concerts sponsored by the University Events Office. The Department of Theatre and Dance presents plays in both the 500-seat Mandell Weiss Theatre and the 500-seat Forum Theatre. The Department of Visual Arts offers a continuing series of art shows in the Mandeville Art Gallery and displays of student art in other campus galleries.

Informal meeting places on campus are hubs of student activity throughout the day and evening, among them the Muir Rathskeller, Marshall College Mountain View Lounge, and the Price Center.

Mountains, Deserts, and Beaches

Many Southern Californians enjoy the out-of-doors. The San Diego metropolitan area enjoys the most comfortable year-round climate in the United States.

Fishing opportunities are plentiful offshore in kelp beds west of La Jolla and surrounding the Coronado Islands in Mexican waters. Fresh water fishing is available in nearby lakes. An hour's drive to the east, the Laguna Mountains provide pleasure during all seasons for campers and hikers. Beyond the Lagunas lies the vast Anza-Borrego Desert with its breathtaking display of wildflowers every spring.

The peninsula of Baja California, one of the world's last great wilderness areas, stretches for 900 miles southward from the international gateway at Tijuana. It is the site every year of the grueling Baja cross-country auto race.

Sports at UCSD

Through its intercollegiate athletic and intramural programs, UCSD provides its students with one of the more extensive and competitive sports programs in the United States. UCSD fields a wide variety intercollegiate athletic teams along with several club sports teams, while the intramural program provides for student competition in a wide variety of sports in three categories of play: men, women, and coed.

Need More Information? Check the Following:

How do I apply for admission? See pages 32 and 41. (See also "Note," below.)

How much does a UCSD education cost? See "Fees and Expenses," page 45.

What's the grading system at UCSD? See page 58.

How should I decide which college to choose at UCSD? See page 13.

What services and facilities are available to students at UCSD? See page 87.

Note: An admissions packet for students interested in applying to UCSD can be obtained from any California high school or community college counselor's office, by writing to the Office of Admissions on any University of California campus, or online at www.ucop.edu/pathways/appctr.html.

Undergraduate Departments

ARTS
- Music
- Theatre and Dance
- Visual Arts

SCHOOL OF ENGINEERING
- BE (Bioengineering)
- CSE (Computer Science and Engineering)
- CE (Chemical Engineering, Program)
- ECE (Electrical and Computer Engineering)
- MAE (Mechanical and Aerospace Engineering)
- SE (Structural Engineering)

HUMANITIES
- History
- Literature
- Philosophy

SCIENCE AND MATHEMATICS
- Biological Sciences
- Chemistry and Biochemistry
- Mathematics
- Physics

SOCIAL SCIENCE
- Anthropology
- Cognitive Science
- Communication
- Economics
- Ethnic Studies
- Linguistics
- Political Science
- Psychology
- Sociology

Departmental Undergraduate Majors

ANTHROPOLOGY
- Anthropological (Archaeology) ..... B.A.
- Anthropology ..... B.A.
- Anthropology (Biological Anthropology) ..... B.A.

BIOENGINEERING (BE)
- Bioengineering ..... B.S.
- Bioengineering: Premedical ..... B.S.
- Bioengineering: Biotechnology ..... B.S.
- Bioengineering: Bioinformatics ..... B.S.

BIOLOGICAL SCIENCES, DIVISION OF
- General Biology ..... B.S.
- Biology with a Specialization in Bioinformatics ..... B.S.
- Animal Physiology and Neuroscience ..... B.S.
- Biochemistry and Cell Biology ..... B.S.
- Ecology, Behavior, and Evolution ..... B.S.
- Human Biology ..... B.S.
- Microbiology ..... B.S.
- Molecular Biology ..... B.S.

CHEMICAL ENGINEERING PROGRAM
- Chemical Engineering ..... B.S.

CHEMISTRY AND BIOCHEMISTRY
- Chemistry ..... B.S.
- Biochemistry/Chemistry ..... B.S.
- Chemical Education ..... B.S.
- Chemical Physics ..... B.S.
- Chemistry/Earth Sciences ..... B.S.
- Environmental Chemistry ..... B.A./B.S.
- Molecular Synthesis ..... B.S.
- Pharmacological Chemistry ..... B.S.
- Bioinformatics from the Department of Chemistry and Biochemistry ..... B.S.

COGNITIVE SCIENCE
- Cognitive Science ..... B.A./B.S.
- Cognitive Science/Clinical Aspects of Cognition ..... B.S.
- Cognitive Science/Computation ..... B.S.
- Cognitive Science/Human Cognition ..... B.S.
- Cognitive Science/Human Computer Interaction ..... B.S.
- Cognitive Science/Neuroscience ..... B.S.

COMMUNICATION
- Communication ..... B.A.

COMPUTER SCIENCE AND ENGINEERING (CSE)
- Computer Science ..... B.A./B.S.
- Computer Engineering ..... B.S.
- Computer Science with Specialization in Bioinformatics ..... B.S.

ECONOMICS
- Economics ..... B.A.
- Management Science ..... B.S.
- Economics–Mathematics ..... B.A.

EDUCATION (see Footnote 1)

ELECTRICAL AND COMPUTER ENGINEERING (ECE)
- Computer Engineering ..... B.S.
- Electrical Engineering ..... B.S.
- Engineering Physics ..... B.S.

ENGINEERING (see BE, CSE, ECE, MAE, and SE)

ENGLISH (see Literature)

ETHNIC STUDIES
- Ethnic Studies ..... B.A.

HISTORY
- History ..... B.A.

LINGUISTICS
- Cognition and Language ..... B.A.
- Language and Society ..... B.A.
- Language Studies ..... B.A.
- Linguistics ..... B.A.

LITERATURE
- Literatures in English ..... B.A.
- French Literature ..... B.A.
- German Literature ..... B.A.
- Italian Literature ..... B.A.
- Russian Literature ..... B.A.
- Spanish Literature ..... B.A.
- Literature/Composite ..... B.A.
- Literature/Writing ..... B.A.
- Literatures of the World ..... B.A.

MATHEMATICS
- Mathematics ..... B.A.
- Applied Mathematics ..... B.A.
- Mathematics–Computer Science ..... B.A.
- Mathematics–Applied Science ..... B.A.
- Mathematics–Economics ..... B.A.
- Mathematics-Scientific Computation ..... B.S.
- Mathematics–Secondary Education ..... B.A.

MECHANICAL AND AEROSPACE ENGINEERING (MAE)
- Aerospace Engineering ..... B.S.
- Engineering Sciences ..... B.S.
- Mechanical Engineering ..... B.S.
- Environmental Engineering ..... B.S.

MUSIC
- Computing and the Arts ..... B.A.
- Music ..... B.A.
- Music/Humanities ..... B.A.

PHILOSOPHY
- Philosophy ..... B.A.

PHYSICS
- General Physics ..... B.A.
- General Physics/Secondary Education ..... B.A.
- Physics ..... B.S.
- Physics/Biophysics ..... B.S.
- Physics with Specialization in Computational Physics ..... B.S.
- Physics with Specialization in Earth Sciences ..... B.S.
- Physics with Specialization in Materials Physics ..... B.S.
- Physics with Specialization in Astrophysics ..... B.S.

POLITICAL SCIENCE
- Political Science ..... B.A.

PRELAW (see Footnote 2)

PREMEDICAL (see Footnote 3)

PSYCHOLOGY
- Psychology ..... B.A./B.S.

SOCIOLOGY
- Sociology ..... B.A.

STRUCTURAL ENGINEERING (SE)
- Engineering Sciences ..... B.S.
- Structural Engineering ..... B.S.

TEACHER EDUCATION (see Footnote 1)

THEATRE
- Dance ..... B.A.
- Theatre ..... B.A.
- Theatre and Dance ..... B.A.

VISUAL ARTS
- Art History/Criticism ..... B.A.
- Art History/Criticism and Computing and the Arts ..... B.A.
- Art History/Criticism and Media ..... B.A.
- Art History/Criticism and Studio ..... B.A.
- Computing and the Arts ..... B.A.
- Media ..... B.A.
- Studio ..... B.A.

INTERDISCIPLINARY MAJORS
- Chinese Studies ..... B.A.
- Classical Studies ..... B.A.
- College Special Individual Majors ..... B.A.
- Critical Gender Studies ..... B.A.
- Earth Sciences ..... B.S.
- Environmental Systems—Earth Sciences ..... B.S.
- Environmental Systems—Ecology, Behavior and Evolution ..... B.S.
- Environmental Systems—Environmental Chemistry ..... B.S.
- Environmental Systems—Environmental Policy ..... B.A.
- German Studies ..... B.A.
- Human Development ..... B.A.
- International Studies ..... B.A.
  - Anthropology
  - Economics
  - History
  - Linguistics
  - Literature
  - Political Science
  - Sociology
- Italian Studies ..... B.A.
- Japanese Studies ..... B.A.
- Judaic Studies ..... B.A.
- Latin American Studies ..... B.A.
- Religion, Studies in ..... B.A.
- Russian and Soviet Studies ..... B.A.
- Third World Studies ..... B.A.
- Urban Studies and Planning ..... B.A.

Footnote 1: The teaching credential in California requires an academic major, plus professional preparation courses in education, an approved program of practice teaching or an internship, and a full year of college work beyond the baccalaureate. The UCSD Teacher Education Program (TEP) leads to a single subject (secondary) or multiple-subjects (elementary) credential.

Footnote 2: Law schools do not require any particular major, but they do require evidence of good scholarship in demanding subjects. Almost any undergraduate major can qualify a student for consideration by a law school. The UCSD career services staff includes professional prelaw advisers.

Footnote 3: Like law schools, medical schools do not generally demand a particular major but ask for a solid background in the sciences upon which medicine is built. Most premed students major in biology, chemistry, physics, or bioengineering, but a substantial number major in the humanities and social sciences. The UCSD career services staff includes professional premedical advisers.

Choosing a College at UCSD

One of the features which sets UCSD apart from most major universities in the United States is its family of undergraduate colleges: Revelle, John Muir, Thurgood Marshall, Earl Warren, Eleanor Roosevelt, and Sixth.

The division of the campus community into small colleges was patterned after the concept which has served Oxford and Cambridge so successfully for centuries. The planners of the UCSD campus were convinced that students learn more, and find greater fulfillment in their personal lives, when joined academically and socially with a relatively small group of students. At the same time, the advantages of size in a university, including a faculty of international renown, first-rate teaching and research facilities, laboratories, libraries, and other amenities, were to be an important part of the design.

The result was an arrangement which combined the academic advantages of a large research university with the finest features of a small liberal arts college—the UCSD college system. Each of these semi-autonomous undergraduate colleges has its own residence facilities, staff, traditions, general-education requirements, and distinctive educational philosophy. The system was inaugurated with the opening of Revelle College in 1964. In the intervening years, five more colleges—John Muir, Thurgood Marshall, Earl Warren, Eleanor Roosevelt, and Sixth—have been established. Although many American university campuses have a separate college structure, in most cases, these colleges are designed to serve specific disciplines, such as engineering or business administration. At UCSD, however, any undergraduate may select from the full range of majors available. The choice of a college is not based on your major, but on your preferences in terms of the various educational philosophies and environments offered by the colleges.

UCSD's college system allows undergraduates to choose from among *six* distinct general-education curricula supplementing their major requirements. These curricula range from a very structured liberal arts program to a program with a broad range of electives. By contrast, most universities offer only *one* general-education curriculum.

Students must rank the colleges in order of preference when applying for admission. Brief summaries of the various college curricula and philosophies follow. Later in this section, these variations are spelled out in considerable detail, college by college.

Revelle College Educational Philosophy

Revelle College stresses the broad character of general education. A structured liberal arts curriculum establishes a strong educational foundation for any major. All students complete a highly respected core humanities sequence and courses in the arts and social sciences. Students either meet proficiency in a foreign language or complete the fourth quarter of college level instruction. All students also complete sequences in mathematics and science, with separate courses available for science and non-science majors. Throughout the final two years, students concentrate on developing professional competence in an academic discipline.

This curriculum develops three main skills which are essential for a well-rounded education: learning to use the language of scholarship and science, learning how to think creatively, and learning how to learn.

Revelle College is distinguished by its emphasis on academics and student leadership. Its structured and well-rounded curriculum has been acclaimed nationally. Individual academic advising, honors programs, and programs that foster student-faculty interaction, are all hallmarks of UCSD's first college.

John Muir College Educational Philosophy

John Muir College has established a flexible set of general-education and graduation requirements that ensures breadth and depth of learning and encourages the students of the college to take an active role in their own intellectual development. Students complete four year-long sequences drawn from the social sciences; the natural sciences or mathematics; and two sequences out of the following three areas: the humanities, fine arts, or foreign languages. Many choices are available for each of these year-long sequences. Muir has a one-course U.S. cultural diversity graduation requirement. Students also complete two analytical writing courses. Muir's requirements accommodate a wide range of interests and aptitudes, and Muir's academic advisers meet with students on a one-to-one basis. The relative openness and flexibility of its curriculum make Muir College particularly attractive to exceptionally able and well-prepared students with well-defined or developing academic interests.

John Muir College is distinguished by its atmosphere of friendliness and informality and a deep concern for the rights and welfare of others. Concern for one's fellow students goes well with Muir's educational philosophy, which stresses individual choice and development. The environment thus created fosters independence and responsibility, and well-rounded students.

Thurgood Marshall College Educational Philosophy

The dedicated focus of Thurgood Marshall College is the active development of the student as scholar and citizen. The college, a small liberal arts and sciences community, is characterized by an open, friendly environment in which students pursue any major in the natural and physical sciences, social sciences, engineering, humanities, and fine arts offered at the university.

The college's educational philosophy is guided by the belief that, regardless of a student's major, a broad liberal arts education must include an awareness and understanding of the diversity of cultures that comprise contemporary American society, and the richness that socio-cultural diversity brings to the lives of American people.

Integral to the Marshall experience is the unique, three-quarter core sequence, "Dimensions of Culture—Diversity, Justice, and Imagination." This interdisciplinary, issues-oriented curricular experience explores both the diversity of American experiences across race, religion, class, and gender, and also the shared resources all Americans draw on when their different identities and interests conflict. Students also choose courses in mathematics or logic, natural/physical

sciences, writing, humanities, and fine arts to fulfill general-education requirements.

In addition to the strong academic program, Thurgood Marshall College is proud of its emphasis on the student as citizen. Students are encouraged to integrate educational alternatives and public service opportunities, such as Partners at Learning (PAL), for which they earn academic credit, into their curriculum. Through PAL and other options, such as study abroad, internships, public service and leadership activities, students develop skills learned in the classroom and apply them to real-world experiences. Toward that end, the Student Leadership Program is especially designed to encourage active participation in the governance of the college and in community service.

Thurgood Marshall College's hallmark is community, where students are encouraged to be active participants in their university education and take advantage of the abundance of opportunities to learn and develop as exemplary scholars and citizens in a multicultural twenty-first century.

Earl Warren College Educational Philosophy

Earl Warren College was founded in 1974 and named in honor of the former governor of California and Chief Justice of the United States. The Warren Court elaborated a doctrine of fairness in such areas as criminal justice, voting rights, legislative districts, employment, housing issues, transportation, and, most famously, education. Justice Warren had a principled commitment to education, opportunity, and hard work. Warren College offers students the benefit of a small campus environment with the resources of a renowned faculty and major research institution. Consistent with Earl Warren's principles, the college is committed to preparing students for life intellectually, socially, and professionally. The success of each and every Warren student is our goal. Warren students represent all disciplines offered at UCSD. Graduation requirements include a major and two secondary programs of study which encompass academic areas outside of a student's major.

Eleanor Roosevelt College Educational Philosophy

Eleanor Roosevelt College (ERC) emphasizes a comprehensive general education designed to prepare students to compete successfully in the global and multicultural economy of the twenty-first century. Successful professional people will need to understand their own cultural heritage as well as those of people from other societies with whom they will be interacting in their workplaces and communities.

The perspectives gained at ERC prepare students well for the future, whatever their goals and their major field of study, and whether they plan to go on to graduate school, professional school, or the worlds of science and technology, business, or the arts.

At the core of the curriculum are six courses comprising The Making of the Modern World (MMW). This interdisciplinary sequence was developed by faculty from anthropology, history, literature, political science, and sociology. It teaches students to think historically and analytically, as well as across disciplines, about both Western and non-Western societies, and the ways humans have organized their experience in different places and times.

ERC students receive exposure to natural science, quantitative methods, foreign language, and fine arts, and each selects a geographic region for in-depth study. Interested students are encouraged and assisted in finding ways to study, work, or travel in other countries to expand their horizons.

A friendly and supportive campus community, ERC is also distinguished by its emphasis on helping each individual reach his or her full potential intellectually, and in those skills, contributing to effective participation and leadership.

As Eleanor Roosevelt wrote, "Whether or not they have made the world they live in, the young must learn to be at home in it, to be familiar with it. They must understand its history, its peoples, their customs and ideas and problems and aspirations." ERC students and graduates find themselves as much "at home" in the world as any of their generation, and more than most!

Sixth College Educational Philosophy

Sixth College challenges students to explore the historical and philosophical connections among culture, art, and technology, and how they energize each other. Students come to understand that innovation in every field draws upon a cultural ground. Sixth explores new technologies to create a learning community that reaches beyond the campus and encourages lifelong learning. Through interdisciplinary and cross-cultural study, Sixth provides an ideal intellectual and artistic framework for a contemporary liberal arts education. Sixth College general-education requirements include a unique three-quarter sequence which emphasizes study across academic disciplines in culture, art, and technology (CAT), including courses to develop computer and information literacy, writing, and communication skills. The flexible nature of our breadth requirements includes requirements across the social sciences, fine arts, humanities, natural sciences, math/ logic, and statistical methods. In addition, students will develop a project for the upper-division practicum to be completed in the junior or senior year.

Sixth will provide opportunities for student collaborations within the university and beyond, inspiring students to address, thoughtfully and actively, the serious needs of our communities.

Sixth College is a proud participant in the new **Cal-(IT)²** initiative, led by UCSD. As such, the college will take part in, and benefit from, research that guides innovation in telecommunications and information technology, with the goal of revolutionizing how we live, work, and communicate.

College Administration

The provost is a faculty member who acts as chief administrative officer and academic dean. In addition to the provost, each college has a dean of academic advising and a dean of student life.

The academic departments and the college academic advising offices are designated campus units responsible for providing official academic advice and direction to undergraduate students. The college academic advising staff have primary responsibility for providing academic advice and services that assist new and continuing students in developing educational plans and course schedules which are compatible with their interests, academic preparation, and career goals.

The college academic advising offices conduct academic orientation/enrollment programs for all new students and advise continuing students about college general-education and graduation requirements. The advising staff of each college provide general academic and curricular information, clarify academic rules and regulations,

GRADUATION REQUIREMENTS IN THE UCSD COLLEGES

Unless otherwise indicated, the figures in this chart refer to the number of COURSES rather than the number of units. Most UCSD courses carry four quarter-units of credit, and a student usually takes four courses each quarter. Academic disciplines are classified as humanities/fine arts, social sciences, and mathematics/natural sciences/engineering. The term "noncontiguous" refers to a discipline that is different from that of the major. Students must meet the Subject A requirement prior to enrolling in the writing courses of their respective college. Each college's cultural diversity requirement can be fulfilled as noted by an asterisk (*) below.

GENERAL EDUCATION

REVELLE COLLEGE

HUMANITIES 5
Includes intensive instruction in university-level writing.

FOREIGN LANGUAGE ...0-4
Proficiency exam or number of courses.

FINE ARTS 1
Art, music, theatre

PHYSICS AND CHEMISTRY 4
At least one course from each area (Sequences available for science and non-science majors.)

BIOLOGY 1

CALCULUS 3
(Sequences are available for science and non-science majors.)

SOCIAL SCIENCES 3
To include at least one course in American Cultures*

AREA OF FOCUS 3
Focused on one subject noncontiguous to the major.

JOHN MUIR COLLEGE

ANALYTICAL WRITING 2-3

A Three-Course Sequence in one of the disciplines from the: 3
SOCIAL SCIENCES

A Three-Course Sequence in either 3
MATHEMATICS (CALCULUS)
OR
One of the disciplines from the
NATURAL SCIENCES

A Three-Course Sequence in each *of TWO of the disciplines from TWO* different categories.....6
FINE ARTS
HUMANITIES
FOREIGN LANGUAGE

THURGOOD MARSHALL COLLEGE

DIMENSIONS OF CULTURE.....3
Includes two six-unit courses with intensive instruction in university-level writing

HUMANITIES 2
Includes cultural diversity

FINE ARTS.....1

NATURAL SCIENCES 3
One course each in biology, chemistry, and physics. (Courses are available for science and non-science majors.)

MATHEMATICS AND LOGIC 2
(Courses are available for science and non-science majors.)

DISCIPLINARY BREADTH.....4
Noncontiguous to the major. Two must be upper-division; one must include writing.

PUBLIC SERVICE ..... (optional)
The four-unit public service option may be used to fulfill one course in Disciplinary Breadth.

EARL WARREN COLLEGE

WRITING.....2

ETHICS AND SOCIETY.....1

FORMAL SKILLS.....2
Two courses to be selected from a list including calculus, symbolic logic, computer programming, and statistics.

PROGRAMS OF CONCENTRATION*.....12
(for B.A./B.S. degrees in arts/sciences)
Two programs of concentration, each typically consisting of three lower-division and three upper-division courses. Both programs must be noncontiguous to the major and to each other.

OR
AREA STUDIES 6
(for B.S. degrees in engineering)
Two area studies each consisting of three courses. One area of study in humanities/fine arts and one in social sciences.

ELEANOR ROOSEVELT COLLEGE

THE MAKING OF THE MODERN WORLD.....6
Includes two six-unit courses with intensive instruction in university-level writing *and* cultural diversity*.

FOREIGN LANGUAGE...0-4
Proficiency exam or number of courses.

FINE ARTS.....2
To include study of both Western and non-Western arts.

NATURAL SCIENCES 2
(Sequences are available for science and non-science majors.)

MATHEMATICS/ COMPUTER SCIENCE 2
(Sequences are available for science and non-science majors.)

REGIONAL SPECIALIZATION.....3
To include at least two courses taken at the upper-division level.

SIXTH COLLEGE

CULTURE, ART, AND TECHNOLOGY.....3
Three core sequence CAT 1, 2, and 3. Includes two (six unit) courses of intensive instruction in university-level writing.

COMPUTING REQUIREMENT.....1
This requirement may be satisfied with courses from a variety of departments.

MODES OF INQUIRY.....7
Two courses in social sciences, two courses in humanities, two courses in natural sciences, one course in math/logic (different options available for science and non-science majors)

UNDERSTANDING DATA.....1
One course in statistical methods (different options available for science and non-science majors)

SOCIETAL AND ETHICAL CONTEXTS.....2
One course in ethnic or gender studies; one course in ethics.

ART MAKING.....2
Two courses in music, theatre (including dance), or visual arts.

PRACTICUM.....0.5 TO 1.5
Upper-division project with a two unit course in practicum communication.

MINOR/ADDITIONAL GRADUATION REQUIREMENTS

REVELLE COLLEGE	JOHN MUIR COLLEGE	THURGOOD MARSHALL COLLEGE	EARL WARREN COLLEGE	ELEANOR ROOSEVELT COLLEGE	SIXTH COLLEGE
Optional Minor	Optional Minor—*One U.S. Cultural Diversity course to be chosen from an approved list as part of the major, optional minor, elective, or an appropriate general-election course.	Optional Minor	Optional Minor—Students may choose a noncontiguous minor in lieu of a Program of Concentration. *One Cultural Diversity in U.S. Society course to be chosen from an approved list as part of the major, Programs of Concentration/ Area Studies, or elective.	Optional Minor—Students may combine foreign language and regional specialization course work to create a minor focusing on a particular geographic area.	Optional Minor

MINIMUM NUMBER OF COURSES REQUIRED FOR GRADUATION

B.A./B.S. degrees require a minimum of 46 courses (184 units); at least 15 courses (60 units) must be upper-division.	B.A./B.S. degrees require 45 courses (180 units). At least *18 courses (72 units) must be upper-division.*	B.A./B.S. degrees require 45 courses (180 units). At least 60 units must be upper-division.	B.A./B.S. degrees require 45 courses (180 units). At least 15 courses (60 units) must be upper-division.	B.A./B.S. degrees require 45 courses (180 units). At least 15 courses (60 units) must be upper-division.	B.A./B.S. degrees require a minimum of 45 courses (180 units). At least 15 courses (60 units) must be upper-division.

MAJOR

NOTE: STUDENTS MAY PURSUE ANY MAJOR, REGARDLESS OF THE COLLEGE THEY CHOOSE. Majors are identical regardless of the student's chosen college. Most majors require twelve to eighteen upper-division courses based upon adequate lower-division preparation; such preparation may be part of the general-education requirements. *Majors in certain engineering programs may require as many as twenty-one upper-division courses.*

review all aspects of academic probation, monitor academic progress, assist students with decision-making strategies, and give information about prerequisites and screening criteria for majors. In conjunction with the academic departments and the Office of the Registrar, the advising offices certify students for graduation and generally facilitate their academic adjustment to the university.

Moreover, college academic advisers are available to counsel students about educational alternatives; selection of courses and majors; program changes; new academic opportunities; and special programs such as exchange programs, honors programs, outreach programs, etc.

With a central concern for student development, dean's staff members provide a variety of nonacademic services such as coordinating both educational and social programs; overseeing residential programs; assisting students with decisions and procedures regarding withdrawal from school; coordinating disciplinary procedures, both academic and social; and making referrals to other student services on campus. (See also section on "Student Services and Programs.")

Whatever the question or concern, the provost and his or her staff stand ready at all times to assist undergraduates.

Phi Beta Kappa

The UCSD chapter of Phi Beta Kappa elects student members on the basis of high scholastic achievement in academic programs emphasizing the liberal arts and sciences. Phi Beta Kappa was founded in 1776 at the College of William and Mary in Virginia and is the oldest, most prestigious, academic honor society in America. See also "Honors" in the index.

Honors

Each college awards honors to outstanding students on the basis of criteria approved by the Academic Senate. These honors are posted on students' transcripts and noted on their diplomas. For further details, see "Honors" in the index.

Transfer Students

Students transferring to UCSD must complete the requirements of the chosen undergraduate college. Students are strongly advised to complete all lower-division preparation for the major prior to enrollment. In preparation for the New Student Orientation Program, the College Academic Advising staff will evaluate the transfer course work for each student to determine which courses are applicable to general-education requirements. Since a variety of general-education options are available, students are encouraged to choose carefully the college which best fits their general-education program or course work. See Undergraduate Admissions, Policies and Procedures, "University of California Transfer Agreement."

Revelle College

Revelle College, the first college on the UCSD campus, was named in honor of Dr. Roger Revelle, former university-wide dean of research and for many years director of UCSD's Scripps Institution of Oceanography. Dr. Revelle is perhaps best known for his prediction of the Greenhouse Effect.

Revelle College was established in 1958. With the establishment of Revelle College, the faculty was given a rare opportunity to shape an undergraduate curriculum that would, insofar as any educational program can, prepare its students for the modern world. From the outset of planning the curriculum, the faculty asked: What sort of knowledge must students have if they are to be liberally educated? In what areas? To what depth? How specialized must that education be in the undergraduate years?

The educational philosophy of Revelle College was developed in response to such fundamental questions. Its undergraduate program is based on the assumption that students who are granted the bachelor's degree will have attained:

1. An acceptable level of general education in mathematics; foreign language; the physical, biological, and social sciences; the fine arts; and the humanities.
2. Preprofessional competence in one academic discipline.
3. An understanding of an academic area outside their major field.

To this end, a lower-division curriculum has been established which enables students to acquire an understanding of the fundamental problems, methods, and powers of the humanities and the arts, the social and behavioral sciences, mathematics, and the natural sciences.

The lower-division curriculum assumes that undergraduates should not concentrate heavily in a special field until they have had a chance to learn something about the various fields that are open to them. Their general education must, then, be thorough enough for them to see the possibilities in those fields. Early in their careers, they should know three languages: their own, a foreign language, and the universal language of mathematics.

During the students' junior and senior years, their main efforts will be devoted to intensive work in their major field at a level of competence that will enable them to continue their study at the graduate level. In addition to the major, students will study an area of learning distinctly different in content from the major.

Revelle College stresses the broad character of its curriculum. Every student, for example, is required to achieve a certain competence in calculus. The emphasis on calculus and physical science is in some respects a deviation from educational theory of the last hundred years. The older "general-education" theory demanded that scientists achieve a reasonable competence in the social sciences and humanities. The rising importance of science and technology justifies the application of the theory to nonscientists as well.

Four years of college can at best yield only a limited knowledge; the major task is to train students so that they can adapt quickly and effectively to the rapidly changing world.

General-Education Requirements

Students are encouraged to meet the general-education requirements and the prerequisites to the major as rapidly as possible. Variations within the program will occur, of course, depending on the student's interest, prior training, and ability to make use of individual study.

Freshmen who enter with Advanced Placement credits can use many of these advanced courses to meet general-education requirements (see Advanced Placement chart in "Undergraduate Admissions, Policies and Procedures"). Transfer students may meet all general-education requirements before entering by following articulation agreements with community colleges or taking at any institution courses which Revelle College deems approximately equivalent in content to those at UCSD.

Those who demonstrate superior achievement and competence in an academic area may take advanced courses and individual study programs.

In order to fulfill the requirements in the principal fields of knowledge, the student takes a recommended set of courses, the prerequisites for which have been met by the general admission standards of the university.

The general-education requirements are:

1. Satisfaction of the general University of California requirements in Subject A and American History and Institutions.
2. A five-course sequence in an interdisciplinary humanities program including two six-unit courses with intensive instruction in university-level writing. Written work is also required in the remaining (four-unit) three-quarter courses.
3. One course in the fine arts.
4. Three lower-division courses in the social sciences, to include two courses in the same social science and at least one course in American cultures.
5. Three courses in mathematics (three quarters of calculus).
6. Five courses in the physical and biological sciences to include four quarters of physics and chemistry and one quarter of biology.
7. Basic conversational and reading proficiency in a modern foreign language, or advanced reading proficiency in a classical language. This requirement can be met by passage of a UCSD proficiency exam (in which case the result is posted to the transcript), or by completion of the fourth quarter (or third semester) of foreign language instruction with a passing grade, or with an equivalent Advanced Placement Exam score of 4 or an SAT II Language Exam score of 700 or higher.
8. Three courses in an area unrelated to the major and focused in one department, subject area, or topic.

1. SUBJECT A AND AMERICAN HISTORY AND INSTITUTIONS

Satisfaction of the university requirements in Subject A and American History and Institutions. (See "Subject A," "Undergraduate Registration," "Academic Regulations," "Humanities," and "Undergraduate Admissions, Policies and Procedures: American History and Institutions.")

2. HUMANITIES

The purposes of the general-education requirement in humanities are two-fold: (a) to confront students with significant humanistic issues in the context of a rigorous course which can serve as an introduction to the academic disciplines of history, literature, and philosophy; (b) to provide training and practice in rhetorical skills, especially persuasive written expression.

Students may meet this requirement by satisfactorily completing five courses of the interdisciplinary humanities program offered by the Departments of History, Literature, and Philosophy, which focus on some of the great documents of civilization. The sequence of courses, Humanities 1 through 5, is designed to meet the humanities and writing requirement of Revelle College. (Students must have satisfied the university's Subject A requirement before registering for this sequence.)

In connection with learning about the Western tradition, students in Humanities 1 and 2 (six units each) will receive intensive instruction in university-level writing. Instruction in writing is provided in discussion sections, and frequent writing exercises are required. Written work is also required in the remaining three quarters of the sequence (Humanities 3-4-5, four units each).

For course descriptions, see "Courses, Curricula, and Programs of Instruction: Humanities."

3. FINE ARTS

One course is required to provide an introduction to the fundamental experience in the interpretation of creativity in theatre, dance, music, or visual arts. (See "Courses, Curricula, and Programs of Instruction: Theatre and Dance, Music, and Visual Arts.")

4. SOCIAL SCIENCES

Three lower-division courses offered by the Departments of Anthropology, Critical Gender Studies, Economics, Human Development, Linguistics, Political Science, Psychology, Sociology, or Urban Studies and Planning. At least one of these courses must be from a list approved as meeting the requirement in American Cultures (TAG students exempt).

5. MATHEMATICS

As an integral part of their liberal education, students will be brought into contact with a significant area of mathematics. Furthermore, they will gain the facility to apply mathematics in their studies of the physical, biological, and behavioral sciences.

There are two beginning-year sequences which meet the Revelle College mathematics requirement. Both sequences include integral and differential calculus. Freshman placement in these sequences is dependent upon the student's high school or college preparation in mathematics (as evidenced by a placement examination) as well as future plans. Students are urged to keep their mathematical skills at a high level by taking mathematics during their senior year in high school. (See "Courses, Curricula, and Programs of Instruction: Mathematics.")

6. NATURAL SCIENCES

The natural science courses, including the physical and biological sciences, present the fundamental concepts of modern physics, chemistry, and biology. For the student who may major in one of these disciplines, the courses provide a background and preparation for further study; for those students who will continue their studies outside the natural sciences, they offer an opportunity to gain a certain understanding and appreciation of current developments in these fields.

Students choose their five required physical and biological science courses from the following sequences depending upon their interests, prior preparation, and intended majors. The Department of Chemistry offers Chemistry 11, 12, 13 (for non-science majors), Chemistry 6A-B-C, and 6AH-BH-CH (honors). The Department of Physics offers four acceptable sequences: Physics 1A-B-C, 2A-B-C-D, and 4A-B-C-D-E, and 11A (for non-science majors). The Department of Biology offers Biology 1 or 3 or 10 (for non-science majors) to meet the Revelle biology requirement. (See "Chemistry," "Physics," and "Biology" in the "Courses, Curricula, and Programs of Instruction" section of this catalog.)

Students planning to major in a science must consult the appropriate departmental listing under "Courses, Curricula, and Programs of Instruction" to find the additional preparation needed for their major.

7. FOREIGN LANGUAGE

Revelle College students are required to demonstrate basic conversational and reading proficiency in any modern foreign language, or advanced reading proficiency in a classical language or complete the fourth quarter of foreign language instruction with a passing grade.

Modern foreign language programs are currently offered in Chinese, French, German, Hebrew, Italian, Japanese, Korean, Russian, Spanish, and classical language programs are offered in Greek, Latin, and Hebrew. Students who have preparation in other languages should see the Office of the Revelle Provost to arrange a proficiency examination. This exam may also be taken by native speakers of *any* foreign language without further course study.

8. AREA OF FOCUS

Three courses in an area noncontiguous to the major are required. The three courses must be interrelated and should focus on some discipline, subject area, or topic. For the purposes of this requirement, the humanities/arts, the social sciences, and the natural sciences/engineering/mathematics are considered three different areas. Courses from a single department will be considered focused. Courses from more than one department should be approved prior to enrolling. The area of focus is not posted to the diploma or transcript.

These three courses may not be used on any other requirements. These courses may be upper-division or lower-division but one should keep in mind that graduation requirements stipulate that at least sixty units of all work must be from upper-division courses. The courses may be taken pass/not pass and Advanced Placement or International Baccalaureate credits may be used.

Students may complete an optional noncontiguous minor to replace this requirement, if they wish to do so.

Sample Program

FALL	WINTER	SPRING
FRESHMAN YEAR		
Foreign Language	Humanities 1	Humanities 2
Mathematics	Foreign Language	Foreign Language
Natural Science	Mathematics	Mathematics
Subject A or Fine Arts	Natural Science	Natural Science
SOPHOMORE YEAR		
Natural Science	Natural Science	Fine Arts or elective
Social Science	Social Science	Social Science
Humanities 3	Humanities 4	Humanities 5
Major Preparation	Major Preparation	Major Preparation

* Science majors may want to take part of the social science requirement in the junior year to allow time for additional science laboratories and/or mathematics.

Transfer Students

Transfer students may enter Revelle College by following community college articulation agreements which can be viewed at www.ASSIST.org or by signing up for specific Transfer Admissions Guarantee (TAG) plans or by following the Intersegmental General Education Transfer Curriculum (IGETC). However, Revelle College does not accept IGETC as satisfaction of all its lower division requirements. Revelle accepts IGETC courses to meet requirements with additional classes in

science, mathematics and foreign language. (Students are exempt from the language requirement if they can pass proficiency in any foreign language.) Science and mathematics majors will need these additional classes in preparation (or to meet prerequisites) for their major. The additional math/science classes or language classes can be taken at the community college or after transfer to UCSD. See details on our Web site at http://revelle.ucsd.edu/prospective/ igetc+.html.

The Major

All undergraduate majors offered at UCSD are available to Revelle College students. An exceptional student who has some unusual but definite academic interest for which a suitable major is not offered on the San Diego campus may, with the consent of the provost of the college and with the assistance of a faculty adviser, plan his or her own major. The Revelle Individual Major must be submitted no later than three quarters before the student's intended graduation and be approved by the Executive Committee of the college before it may be accepted in lieu of a departmental or interdepartmental major. The faculty adviser will supervise the student's work, and the provost must certify that the student has completed the requirements of the individual major before the degree is granted.

Students who fail to attain a grade-point average of at least 2.0 in work taken in the prerequisites for the major, or in the courses in the major, may, at the option of the department, be denied the privilege of entering or of continuing in that major. Students majoring in bioengineering, bioinformatics, ICAM, CSE, ECE, or math/computer science need to be aware of additional screening for acceptance into the major.

Optional Minor

A minor is no longer required in Revelle College. However, if a student wishes to complete a Department Minor or a Project Minor and have it posted to the transcript, he or she may do so. If a student completes either of these types of minors in a field noncontiguous to that of the major, it will replace the three-course noncontiguous area of focus general education requirement.

There are two types of minors from which to choose in Revelle College:

1. Department Minor—All courses for the minor are taken in one department and they are chosen with the advice and approval of a minor adviser in that department.
2. Project Minor—A project minor centers on a topic or period chosen by the student. The project is often interdepartmental and interdisciplinary. The program must have the approval of a minor adviser. (See Academic Regulations: Undergraduate Minors and Programs of Concentrations.)

The current university guidelines for the minor require seven courses (twenty-eight units), five of which must be upper-division. Students who entered prior to January 1, 1998, may complete their six course (twenty-four unit), three upper-division course minors.

Enhancing Your Education

Students are able to enhance their undergraduate education by participating in the UC Education Abroad Program (EAP) and UCSD's Opportunities Abroad Program (OAP) while still making regular progress toward graduation. Information on EAP/OAP is detailed in the Education Abroad Program section of the UCSD General Catalog. Interested students should contact the Programs Abroad Office in the International Center and visit the Web site at http://www.icenter/pao. Financial aid recipients may apply aid to the program and special study abroad scholarships are readily available.

Many programs are now available for sophomores, as well as juniors and seniors. With careful planning students should be able to fulfill some general-education, major, and/or minor requirements while studying abroad.

Pass/Not Pass Grading Option

1. No more than one-fourth of an undergraduate student's total course units taken at UCSD and counted in satisfaction of degree requirements may be graded on a Pass/Not Pass basis.
2. Courses used to satisfy the noncontiguous area of focus may be taken on a Pass/Not Pass basis. Use of Pass/Not Pass grades on the optional minor is decided by the department.
3. Courses taken as electives may be taken on a Pass/Not Pass basis.
4. The following general education courses may be taken Pass/Not Pass: American cultures, fine arts, language and area of focus. Nonscience majors may take courses for the natural science requirement Pass/Not Pass.
5. Upper-division courses to be counted toward a departmental major may not be taken on a Pass/Not Pass basis. Individual departments may authorize exceptions to this regulation.

The Graduation Requirements

In order to graduate from Revelle College, a student must:

1. Satisfy the University of California requirements in Subject A and American History and Institutions.
2. Satisfy the general-education requirements.
3. Successfully complete a major consisting of at least twelve upper-division courses as stipulated by the department and meet the department's major residence requirement if applicable.
4. Complete a minimum of fifteen upper-division courses (60 units).
5. Pass at least 184 units for the B.A./B.S. degree. (No more than 3.0 units of physical education, whether earned at UCSD or transferred from another institution, may be counted towards graduation.)
6. Attain a C average (2.0) or better in all work attempted at the University of California (exclusive of University Extension). Departments may require a C average in all upper-division courses used for the major and/or at least C– grades in each course used for the major.
7. Meet the senior residence requirement. (See "Academic Regulations: Senior Residence.")

Honors

Particularly well-prepared students are invited to join the Freshman Honors Program. Students not eligible at admission will be invited to join the Freshman Honors Program upon obtaining a 3.7 GPA with at least twelve graded units during their first quarter. The program includes weekly participation in small faculty seminars, and a variety of other perquisites.

Quarterly provost's honors, honors at graduation, departmental honors, and Phi Beta Kappa honors are awarded. At least five outstanding graduating seniors are honored at graduation each year with a monetary honorarium. An honors banquet is given for the top two hundred students in Revelle each spring. Seniors are selected for participation in honors seminars. For additional information, see "Revelle Honors Program" and "Honors" in the index.

John Muir College

John Muir College admitted its first students in the fall of 1967 and moved to its present quarters in 1970. The college was named for John Muir (1838–1914), a Scottish immigrant who became a famous California naturalist, conservationist, and author. Muir explored the Sierra Nevada and Alaska, and worked for many years for the cause of conservation and the establishment of national parks and forests. Please visit our Web site at http://provost.ucsd.edu/muir

The Character of the College

Naming a college affirms certain ideas and values. John Muir was committed to learning, self-sufficiency, and the betterment of humankind. Throughout his life he was open to new ideas and experiences which he shared with others through his many books. In keeping with his example, the college has, through its interdisciplinary studies programs, developed courses covering contemporary issues, a major or minor in critical gender studies, and minors in film studies and environmental studies. It has established an individualized major called the Muir Special Project. And it has inaugurated an exchange program with Dartmouth College, one of the most distinguished undergraduate institutions in the United States. Each quarter about fifteen UCSD students attend Dartmouth, while a similar number come from Dartmouth to Muir. By these and other means, the college maintains at UCSD the heritage of the remarkable man for whom it was named.

The General-Education Philosophy and Requirements

John Muir College faculty established Muir's general-education program to guide students toward a broad and liberal education while allowing them substantial choice in the development of that education. This is accomplished by granting students the responsibility and flexibility to customize to a high degree their general-education courses within a broad framework of the following areas of learning: social sciences, mathematics (calculus) or science and two of the following three areas; fine arts, humanities, and foreign languages. Each of these four areas of learning has not merely one but several approved sequences from which students may choose. In addition students are required to complete two specific analytical composition courses. Thus students may tailor their general-education to their personal goals, interests, and academic talents in four personally meaningful general-education sequences.

It should be understood that this freedom carries with it certain responsibilities on the part of the student for careful planning. Students should be aware that:

1. Students should request from the Academic Advising unit of the Office of the Provost a list of general-education requirements and year-long sequences before making their final selection of courses.
2. Complete sequences only may be applied to the general-education requirement. Ordinarily an entire sequence from one department is taken in one academic year.
3. Courses taken to satisfy **only** the general-education requirements and not for a major or minor may, in general, be taken for a letter grade or Pass/Not Pass.
4. Units obtained from advanced placement may be applied toward the 180 units needed for graduation; some units may be used to fulfill partially the general-education requirements.

For students who transfer to Muir College from another institution, the general-education requirements will be interpreted in this way: two semester-courses or three quarter-courses in one subject represented on the approved list normally will be accepted as completing one of the four required sequences. After the Office of Admissions evaluates a student's transcript, the Academic Advising unit of the Office of the Provost makes an evaluation of prior work for each student at the time of his or her first enrollment.

Pass/Not Pass Grading Option

Muir students are reminded that to take a course Pass/Not Pass, they must be in good academic standing (2.0 GPA). No more than one-fourth (25 percent) of an undergraduate student's total UCSD course units counted in satisfaction of degree requirements may be in courses taken on a Pass/Not Pass basis . All major-related courses and most minor courses must be taken for a letter grade. Students are advised to check with their major or minor department regarding restrictions or exceptions.

Enhancing Your Education

Students are able to enhance their undergraduate education by participating in the UC Education Abroad Program (EAP) and UCSD's Opportunities Abroad Program (OAP) while still making regular progress toward graduation. Information on EAP/OAP is detailed in the Education Abroad Program section of the UCSD General Catalog. Interested students should contact the Programs Abroad Office in the International Center and visit the Web site at http://www/icenter/pao. Financial aid recipients may apply aid to the EAP program and special study abroad scholarships are available.

Many programs are now available for sophomores, as well as juniors and seniors. **With careful planning** students should be able to fulfill some general education, major, and/or minor requirements while studying abroad.

Major Programs and Special Projects

A Muir College student may pursue any of the approximately 125 undergraduate majors offered at UCSD. Most major programs at UCSD require a pattern of prerequisites at the lower-division level before students may enroll in upper-division major courses. **Students must declare a major upon accumulating ninety units.** Careful planning will assure the student access to a wide range of majors. Students are strongly encouraged to consult regularly with the college academic advisers as well as departmental major advisers concerning the selection of appropriate courses so as to graduate by the 200 unit maximum limitation.

Each academic department has, in its section of this catalog, a paragraph entitled "The Major Program." ***Students are encouraged to read these sections carefully,*** for they indicate both the extent and the nature of the upper-division program. The following points are useful to keep in mind:

1. A substantial command of at least one foreign language is required by some departments (e.g., international studies, linguistics, literature).
2. Specific science courses are required by many departments. For example, the Department of Computer Science and Engineering and the Department of Electrical and Computer Engineering require Physics 2A-B-C-D or Physics 4A-B-C-D-E; the Department of Chemistry and Biochemistry requires Physics 1A-B-C, Physics 2A-B and C or D, or Physics 4A-B-C-D-E, etc.
3. The physical and life sciences, applied sciences (the School of Engineering majors) together with certain social sciences (including cognitive science and economics), require at least one year of calculus.

The Muir Special Project (MSP) major is a ***B.A. degree* only** and is intended for students who have specific talents and interests which are not accommodated by one of the departmental majors. Each proposal and senior thesis or project must be approved by the Muir provost. The MSP normally includes regular course work and independent study representing up to fifteen upper-division four-unit courses as well as a project or thesis. The project may be one of two kinds: creative work of some sort (e.g., a book of poetry, a collection of musical compositions), or a detailed program of study and research in a particular area. The latter results in a long paper representing a synthesis of knowledge and skill acquired. In either case, a regular member of the UCSD faculty must serve as an adviser to a student doing the project. It should be understood that the demands of a special project major are great, and a project is not appropriate for a student who simply does not want the discipline of a normal major. For a course to be included as part of a Muir Special Project, the student must earn in it a grade of C– or better. Further information may be obtained from the Muir Academic Advising Office.

Graduation Requirements

To receive a degree of bachelor of arts or bachelor of science a John Muir College student must:

1. Declare graduation by completing the electronic Degree and Diploma Application. This must be done by **Friday of the ninth** week of the quarter preceding the quarter of anticipated graduation. Students who plan to graduate at the end of a summer session must complete the above-mentioned process by the **Friday of the ninth week of spring quarter.** Fees may be assessed if students miss these deadlines. **Degrees are not automatically granted: students must file their intention to graduate online at http://degree.ucsd.edu.**
2. Meet the general university requirement in Subject A, English Composition. (See "Undergraduate Admissions, Policies and Procedures.")
3. Satisfy the University of California requirement in American History and Institutions (See "Undergraduate Admissions, Policies and Procedures.")
4. Meet the Muir College requirement in writing proficiency. This requirement asks that the student demonstrate an ability to write English according to standards appropriate for all college work. (See Muir College course listings: "The Writing Program.")
5. Fulfill the general-education requirements.
6. Fulfill the **U.S.** cultural diversity requirement.
7. To receive a B.A. or B.S. degree, students must complete a minimum of forty-five four-unit courses **(180 units)** which includes a **minimum of eighteen upper-division courses (72 units).**
8. Show some form of concentration and focus of study. Ordinarily this is accomplished by completing a department or interdisciplinary major. Students in the college may attempt any major upon completion of the prerequisites. (The Department of Literature/Writing requires students to attain a minimum GPA in prerequisite courses and apply for admission to majors in the departments.) Presently, freshman entry to computer science and computer engineering majors in the CSE and ECE departments is restricted. Refer to the departments for current detailed information. Students who do not choose to meet this requirement by means of a departmental or interdisciplinary major and who qualify may propose a special project major. (See the section, "Major Programs and Special Projects," above.)
9. Satisfy the residency requirement which stipulates that 36 of the last 45 units passed be taken at UCSD as a registered Muir College student. Students planning to study abroad during the senior year should be aware that they must return to complete a minimum number of twenty-four units at UCSD. Such students should see their college Academic Adviser for clarification.
10. Accumulate a grade-point average of at least 2.0 overall and in most majors. Departments may require a C average in all upper-division courses used for the major or C– grades in each course used for the major. Students should consult with their department to determine which grading regulation applies.
11. Make up all incomplete grades. Students may not graduate with "NRs," "IPs," or "Incomplete" entries on their transcript. Therefore, they should be sure that all Incompletes have been cleared and final grades have been properly recorded by the end of the quarter in which they plan to graduate.
12. Complete all requirements for the degree during the quarter in which students file to graduate. If the degree requirements are completed after the expiration of the deadline in a quarter, but before the beginning of the next quarter, students must refile to graduate for the subsequent quarter.
13. Refile the electronic Degree and Diploma Application form if unable to satisfy all graduation requirements, including grade changes, by the end of the proposed graduating quarter. Students will graduate at the end of the quarter in which deficiencies are satisfied.
14. **It is the students' responsibility to contact their department adviser to verify that they have satisfied departmental requirements for graduation.**

While John Muir College does not call for the completion of a minor to fulfill its requirements for the degree of bachelor of arts or bachelor of science, it does acknowledge such completion of an approved departmental minor on a student's transcript. **No upper-division courses may be used to satisfy both a major and a minor.**

Students are required to complete ***twenty-eight units*** of interrelated work, of which at least **twenty units** must be upper-division. Departments or programs may establish more stringent criteria than the minimum. **A formal request for the minor must be approved by the**

department or program and college by the quarter before graduation.

Upon satisfaction of the graduation requirements, Muir College will recommend that the students be awarded the degree of bachelor of arts or bachelor of science (180 units, of which at least seventy-two must be upper-division).

Honors

Quarterly provost's honors, departmental honors, college honors, membership in the Caledonian Society of John Muir College, and Phi Beta Kappa honors are awarded. **Please note that graduating seniors must have letter grades for eighty units of work completed at the University of California for college honors.** For additional information, see "Honors" in the Index.

Honorary Fellows of Muir College

Hannes Alfven, Scientist and Nobel laureate
*Georg von Bekesy, Psychologist and Nobel laureate
*Oscar (Budd) Boetticher, Filmmaker
*David Brower, Conservationist
Francis H.C. Crick, Scientist and Nobel laureate
*Ernst Krenek, Composer
*Ernest Mandeville, Philanthropist
*William J. McGill, Educator
*Jonas Salk, Scientist
*Claude E. Shannon, Mathematician
John L. Stewart, Founding Provost
*Earl Warren, Jurist and Statesman
*Robert Penn Warren, Poet and Novelist
*Mandell Weiss, Philanthropist

*Deceased

Thurgood Marshall College

Thurgood Marshall College, formerly known as Third College, was founded in 1970. From its inception, the college has enriched the lives of undergraduates with its intellectual and philosophic commitment to the development of students as both scholars and citizens. In July of 1993, the college was renamed in honor of the famous lawyer and Supreme Court Justice, Thurgood Marshall. Justice Marshall was widely known and recognized for his historic contributions to American life and dedication to breaking down barriers to education, civil rights, freedom of speech, women's rights, and the right to privacy. Thurgood Marshall College, its faculty, staff, and students are committed to furthering the ideals and dreams of Justice Marshall; accordingly, students are provided opportunities to develop as both scholars and citizens.

Thurgood Marshall's 3,800 students pursue any major in a variety of disciplines. About 40 percent choose majors in biology, the physical sciences, mathematics, and engineering; 35 percent select majors in the social sciences; and 25 percent pursue majors in the humanities and fine arts areas. One of the primary aims of the college is to prepare its students for the pursuit of a rigorous academic curriculum which in turn promotes entry into graduate/professional schools or into the career of one's choice.

Educational Philosophy

The educational philosophy of Thurgood Marshall College is guided by the belief that regardless of a student's major, a broad liberal arts education must include an awareness and understanding of one's role in society. Therefore, the distinctive core sequence, which serves as the centerpiece of the general-education requirements, emphasizes a critical examination of the human condition in our diverse American society. This three-quarter core sequence, "Dimensions of Culture—Diversity, Justice, and Imagination," challenges students to develop an informed awareness of the many cultural perspectives that have shaped American society. The core sequence is designed as an interdisciplinary, contemporary issues-oriented curricular experience that explores both the diversity of American experiences across race, religion, class, and gender, and also the shared resources all Americans draw on when their different identities and interests conflict. Other general-education requirements include courses in mathematics, the physical and biological sciences, humanities, and the arts.

Wishing to uphold the ideals set forth by the college's namesake, Thurgood Marshall students are encouraged to develop their skills not only as scholars, but also as citizens. Therefore, it is our belief that scholarship and social responsibility are mutually compatible. In this regard, our students receive academic credit for participating in the Partners-at-Learning Program (PAL) by taking courses which train and place them as tutors and mentors in local inner city elementary schools and high schools as well as the on-campus model school, The Preuss School. Because this activity shares importance with other academic experiences, completion of one of these specific public service courses, offered through TEP, satisfies an upper-division general-education requirement.

Further underpinning the educational philosophy of Thurgood Marshall College is the belief that the best preparation for a complex, interdependent, and rapidly changing world is a broad liberal arts education, complemented by in-depth study in areas of the student's choice. This educational approach has several major advantages:

1. It guarantees a basic understanding of the principle branches of knowledge: the humanities and arts, social sciences, the natural sciences, and mathematics.
2. It enables students with well-defined interests and goals to begin work in their chosen field of study as first-year students.
3. It allows students who have not decided on a major to sample an array of potential majors while simultaneously satisfying the general-education requirements of the college.

General-Education Requirements

General-education requirements are established by Thurgood Marshall College faculty to be broad and flexible enough to encourage students to integrate other alternatives, such as public service, internships, study abroad, research, special studies, etc., into their academic program. This permits students flexibility in pursuit of their

academic goals and in the practical application of their liberal arts degree, whether they wish to enter the work force or continue their education in graduate or professional school. These courses are designed to introduce students to the academic focus of the college, provide a broad liberal arts and science background, and furnish students with the academic skills and the basic knowledge necessary to pursue any departmental or interdisciplinary major.

The general-education requirements for first-year students are composed of a core sequence and a menu of choices within a liberal arts framework:

1. DIVERSITY, JUSTICE, AND IMAGINATION: This is a three-course interdisciplinary sequence. Two of the three courses are six-units and include intensive instruction in university-level writing. This is a required sequence for all first-year students. All courses must be completed at UCSD and taken on a letter-grade basis only. (See "Dimensions of Culture" in the departmental listings.)
2. FINE ARTS: One course in either music, theatre, or visual arts (non-performance).
3. NATURAL SCIENCES: Three courses. Choose one course each in biology, chemistry, and physics. Courses are available for science and non-science students.
4. QUANTITATIVE/FORMAL SKILLS: Choose two courses in mathematics or one course in mathematics or statistics and one in computing or logic. Courses are available for majors and non-majors.
5. HUMANITIES AND CULTURE: Two courses. Choose one course each from ethnic studies and Third World studies.
6. DISCIPLINARY BREADTH: Four courses. Students choose four courses from a variety of disciplinary breadth areas: humanities/foreign language; social sciences; natural sciences; math/engineering. Courses used to satisfy the disciplinary breadth requirement come from fields outside the major field of study. Two of these courses must be upper-division. At least one upper-division course must include significant writing.
7. PUBLIC SERVICE (optional): This four-unit public service option may be used to fulfill one course in Disciplinary Breadth for any major and fulfills the upper-division writing requirement. (See "Partners at Learning" and Teacher Education Program listings.)

The Thurgood Marshall College Curriculum and Academic Affairs Committee publishes an annual fact sheet with specific course choices which may be used to meet these requirements. Contact the college academic advising office for additional information or refer to the college Web site.

Graduation Requirements

To receive a bachelor's degree from Thurgood Marshall College, a student must:

1. Satisfy the university Subject A requirement. (See "Undergraduate Admissions, Policies and Procedures.")
2. Satisfy the university requirement in American History and Institutions. (See "Undergraduate Admissions, Policies and Procedures.")
3. Fulfill the general-education requirements as described.
4. Complete a departmental or interdisciplinary major.
5. Satisfy the college residency requirement (thirty-five of the last forty-five units must be completed as a registered Thurgood Marshall College student).
6. Successfully complete a minimum of 180 units for the B.A./B.S. degree. At least 60 of these units must be completed at the upper-division level.
7. A 2.0 or better GPA is required for graduation.

Transfer Students

Transfer students have a variety of academic options available to complete lower-division general education prior to transfer. Specific details regarding appropriate general-education agreement are in the section on "Undergraduate Admissions" and through the community college. Students may also contact UCSD Transfer Student Services prior to transfer. Also, the college Web site contains pertinent information.

Majors and Minors

Majors: Thurgood Marshall College students may pursue any of the departmental or interdisciplinary majors offered at UCSD. The majority of the academic departments have established lower-division prerequisites. Generally, these prerequisites must be completed prior to entry into upper-division major courses. Many of these courses may be counted for general-education credit as well. Students are strongly encouraged to work closely with department faculty and college advisers. For details on the specific major departments, refer to the "Courses, Curricula, and Programs of Instruction" section of this catalog.

Minors are optional. However, students are encouraged to keep as many options open as possible. A minor provides an excellent opportunity to complement the major field of study.

Students are required to complete twenty-eight units of interrelated work, of which at least twenty units must be upper-division.

See your college or department for further information.

Pass/Not Pass Grading Option

1. Courses to be counted toward a departmental major or as prerequisites to the major must be taken on a letter-grade basis.
2. Only one upper-division course to be counted toward a college minor may be taken on a Pass/Not Pass basis.
3. Courses taken toward completion of the college general-education requirements, with the exception of Dimensions of Culture (Diversity, Justice and Imagination), may be taken on a Pass/Not Pass basis, while at the same time the restrictions for prerequisites to majors and courses counted toward a minor must be observed.
4. Courses taken as electives may be taken on a Pass/Not Pass basis, while at the same time the restrictions on the majors and minors must be observed.
5. No more than one-fourth of the total University of California, San Diego units may be completed on a Pass/Not Pass basis.

Honors

Quarterly provost's honors, honors at graduation, departmental honors, and Phi Beta Kappa are awarded to Thurgood Marshall College students. For additional information see "Honors" in the Index or speak with the academic honors program adviser in the academic advising office.

Enhancing Your Education

Students are able to enhance their undergraduate education by participating in the UC

Education Abroad Program (EAP) and UCSD Opportunities Abroad Program (OAP) while still making regular progress toward graduation. Information on EAP/OAP is detailed in those sections in the General Catalog. Interested students should contact the Programs Abroad Office in the International Center and visit the Web site at http://www/icenter/pao. Financial aid recipients may apply aid to the program, and special study abroad scholarships are readily available.

College-Sponsored Programs

INDIVIDUAL STUDIES MAJOR

The Individual Studies major allows students to pursue a coherent course of study not formally offered at UCSD. To apply for the major, students must have a 3.25 grade point average. A written proposal with supporting documentation from a faculty adviser, a list of prerequisite courses, and a proposed curriculum plan are required. Students pursuing this major must be goal-oriented and self-directed.

PARTNERS-AT-LEARNING PROGRAM (PAL)

Students may participate in the Partners-at-Learning Program (PAL) by taking specified Teacher Education Program (TEP) courses which train and place them as tutors and mentors in local elementary and high schools as well as at the on-campus Preuss School. Participation in the PAL program can be counted toward satisfying the Public Service option at Thurgood Marshall College. This campuswide program is open to all students in good standing and at the junior level. (See TEP in the department listing—specifically TEP 130, 134, 136, 138, and 139).

PRICE PUBLIC AFFAIRS FORUM

The Price Public Affairs Forum invites leading public figures to speak on important contemporary issues. Such wide-ranging topics as "Race and Justice in America," "Women's Role in the Workplace," and "The Modern American Family" have been presented. These forums are open to the general public.

PUBLIC SERVICE MINOR

Thurgood Marshall College sponsors the Public Service Minor at UCSD, which encourages students to understand the history and practices of public service and to participate in the development of civic skills. This minor is open to all UCSD students in good standing. Please see "Public Service Minor" in the departmental listings.

THE CONTEMPORARY BLACK ARTS PROGRAM

The Contemporary Black Arts Program is an interdisciplinary minor which provides a broad introduction to Afro-American performing arts. (See Contemporary Black Arts in the department listings.)

THURGOOD MARSHALL COLLEGE HONORS PROGRAM

The Thurgood Marshall College Honors Program sponsors activities and events designed to introduce students to the excitement of pioneering research and innovative scholarship in all disciplines at UCSD and to create opportunities for discussion on public issues with locally and nationally known figures. (See Thurgood Marshall College Honors Program in the department listings.)

THURGOOD MARSHALL INSTITUTE

The Thurgood Marshall Institute is heavily devoted to undergraduate research. The institute has organized and supported faculty and student group research projects in the area of education and public law; hosted conferences and symposia on related issues; and trained junior and senior high school instructors in the teaching of the United States Constitution and its amendments.

UCSD-MOREHOUSE/SPELMAN STUDENT EXCHANGE PROGRAM

The UCSD-Morehouse/Spelman Student Exchange Program was established in the fall quarter of 1989. This formal exchange program was developed by Thurgood Marshall College and is open to all UCSD undergraduates. Morehouse and Spelman Colleges are located in Atlanta, Georgia.

The purpose of the program is to provide a unique opportunity for students to live and study at important institutions of higher learning that are significantly different from the social and educational environment typical of California state colleges and universities. Similarly, the exchange students coming to UCSD from Morehouse and Spelman will have an opportunity to experience an exciting and very different educational environment. See the program coordinator in the college academic advising office for additional information.

STUDENT LEADERSHIP PROGRAM

Complementary to the strong academic programs, Thurgood Marshall College is proud of its emphasis on the student as citizen. The Student Leadership Program is especially designed to encourage active involvement in the governance of the college and participation in community and public service programs. College life outside of the classroom and laboratory is a vital part of each student's undergraduate experience. The college offers a wide variety of opportunities for students to shape the nature and character of student life. This active participation allows students to develop self-confidence and strong interpersonal, organizational, and leadership skills. The friendly and outgoing manner of Thurgood Marshall students contributes to a sense of community and mutual respect. This spirit of cooperation is a college hallmark.

Honorary Fellows of the College

Maryann Callery, College Activist
*Cesar Chavez, Civil Rights Activist
Ernesto Galarza, Novelist and Educator
Joseph W. Watson, Educator, Professor, Vice Chancellor
Marian Wright Edelman, President, Children's Defense Fund

*Deceased

Earl Warren College

Earl Warren College opened in the fall of 1974 and currently enrolls more than 4,000 students. The College is named for Earl Warren, former chief justice of the United States Supreme Court and the only three-term governor of California. A native Californian, Justice Warren earned his college and law school degrees at the University of California (B.L. 1912; J.D. 1914). During his governorship, he served as an ex-officio member of the UC Board of Regents for eleven years. He also saw public service as district attorney of Alameda County and as attorney general of California.

As governor during an era of lightning growth for California, Justice Warren developed the State Department of Mental Hygiene and led in reforms of the prison system in California by establishing the Board of Corrections and the Prisoner Rehabilitation Act. In his final role as a public servant, he was chief justice of the United States Supreme Court, which under his leadership elaborated a doctrine of fairness in such areas as criminal justice, voting rights, legislative districting, employment, housing, transportation, and education.

Earl Warren College is committed to preparing its students for active roles in society in their postbaccalaureate years. Whether students wish to continue their education in graduate or professional school, to seek an immediate career or to pursue other options, the college stands ready to assist. Students are advised by the Warren College administration to identify their abilities and interests, examine career possibilities, and prepare for the future over the course of their undergraduate years at UCSD. In addition, the college is a strong supporter of international education and therefore encourages students to pursue the many opportunities that are available for study abroad.

The college's students and faculty represent all disciplines offered at UCSD. Graduation requirements, which consist primarily of one major and two secondary areas of study, enable students to develop a program covering a wide range of material while also focusing on particular areas in depth. The diversity of its academic program has made Warren College an exciting home for students who seek maximum flexibility in designing their own education.

General-Education Requirements

The Warren College faculty has a firm belief that each student should have the opportunity to develop a program best suited to his or her individual interests, within a framework that ensures both depth and breadth of study. All students are required to have significant exposure to the humanities and fine arts, the social sciences, and the natural sciences. The faculty and staff of the college provide extensive advising on individual academic programs and their possible career implications. Students who enroll at Earl Warren College are required to work within the following academic plan:

1. Each student must complete a two-course sequence in writing, Warren Writing 10A-B, within four quarters following successful completion of the Subject A requirement.
2. The college also requires that all students complete a course entitled "Ethics and Society," offered jointly by the political science and philosophy departments (Philosophy 27/Political Science 27). Upon completion of Warren Writing 10A-B, "Ethics and Society" should be taken by the end of the second year at UCSD for letter grade only.
3. All students must satisfy the formal skills requirement by completing two courses chosen from an approved list that includes calculus, computer programming, statistics, and symbolic logic.
4. To ensure a significant exposure to the three disciplinary areas—humanities/arts, social sciences, and natural sciences—all students are required to complete two focused collections of courses outside the areas of their majors. For all students other than B.S. engineering majors, two **focused collections of courses (programs of concentration) are required,** each of which requires six courses outside of the major. A student may choose to declare an optional department minor. In lieu of a program of concentration, a student may choose to declare a minor in a department or interdisciplinary program. These areas of study must cover the two disciplinary areas outside the student's major.

   A few programs of concentration require more than six courses.

For B.S. engineering majors, each student must complete **an area study in the humanities/arts and an area study in the social sciences.**

Each of these area studies consists of three courses of which at least one must be upper-division level.

All **programs of concentration and area studies** must be approved by the Earl Warren College Academic Advising office. A brochure entitled "Earl Warren College Academic Advising Handbook" will be provided to entering Warren students. All minors must be approved by academic departments or programs.

Majors

Earl Warren College students may pursue any of the departmental or interdisciplinary majors offered at UCSD. The majority of the academic departments has established lower-division prerequisites, which, must be completed prior to entry into upper-division major courses. Students are strongly encouraged to work closely with departmental faculty, staff advisers, and college academic counselors. For details on the specific major department requirements, refer to the "Course, Curricula, and Programs of Instruction" section of this catalog.

A student may declare a double major upon the approval of both academic departments and their academic advising office. If the two majors are from noncontiguous discipline areas, one program of concentration or area of study from the third noncontiguous discipline area will be required. If the two majors are from the same discipline area, two programs of concentration or area studies will be required from each of the remaining noncontiguous discipline areas.

The Earl Warren College Individual Studies Major is designed to meet the needs of students who have a definite academic interest for which a suitable major is not offered at UCSD. The student must submit a written proposal explaining the merit of the program and why it cannot be accommodated within existing UCSD major offerings. The proposal must first be approved

by a faculty adviser and then approved by the College Executive Committee.

Minors

In lieu of a program of concentration, Earl Warren students may pursue a departmental minor to fulfill general education requirements. An approved department minor applied toward the general education requirement will be posted to the student's official transcript. Upper-division courses taken for the departmental minor may not overlap with courses in the major, the program of concentration, or the area studies.

Pass/Not Pass Grading Option

Some general education requirements may be fulfilled by courses taken on the Pass/Not Pass basis. Earl Warren students are reminded that major requirements and prerequisites must be taken on the graded basis. The total number of Pass/Not Pass units may not exceed one-fourth of a student's total UCSD units.

Graduation Requirements

To receive a B.A. or B.S. degree from Earl Warren College a student must:

1. Satisfy the University of California requirements in American History and Institutions, and in Subject A. (See "Undergraduate Admissions, Policies and Procedures.")
2. Fulfill the general education requirements described above.
3. Complete one course in Cultural Diversity in U.S. Society to be chosen from an approved list. This course can be part of the major, the general-education, or the electives.
4. Complete a major chosen from those regularly offered at UCSD. Each department determines the courses and grades required for its major; generally this will include a set of twelve to twenty-two upper-division courses. In addition, most majors require a certain amount of introductory course work, and the beginning student is urged to plan a program that will permit a wide choice of major fields. For example, calculus is required for a significant number of majors; a student who does not take this subject excludes all these majors from further consideration.
5. Attain at least 2.0 GPA overall. Major GPA requirements may differ by department.
6. Satisfy the college residency requirement that thirty-six of the last forty-five units passed must be taken as a student in the college.
7. Pass a minimum of 180 units. A minimum of 60 units must be taken at the upper-division level.

Transfer Students

For students who have completed their lower-division general education requirements at an accredited four-year college, and for students who have completed a systemwide or campuswide approved core curriculum in a California community college prior to entering UCSD, the only additional general education requirements are two **upper-division courses noncontiguous to the discipline area** of the major. For these students graduation requirement 3 [above] is waived. All other transfer students must complete the general education requirements above. (See "Earl Warren College" in the section "General Education Requirements.")

The Warren College Honors Program

The Warren College Honors Program is offered to students with a broad range of interests and a history of outstanding scholastic achievement. The program offers students the opportunity to work closely with faculty throughout their academic career at UCSD. High school seniors with a GPA of 3.8 or above, SAT I scores of 700 verbal/700 mathematics, SAT II writing score of 700, or who are National Merit Scholars or Regents Fellows, are eligible for admission to the program. Students may participate in the program until thirty-six units of UCSD credit are completed. After that, a cumulative GPA of 3.5 on all units completed at UCSD must be maintained to remain in the program. Entering transfer students with a GPA of 3.8 based on at least thirty-six units of college work are also eligible. Other students with strong academic credentials may also apply. (For more information, see "Warren College" in the section "Courses, Curricula, and Programs of Instruction.")

Educational Enrichment

Students may opt to study abroad through the University of California's Education Abroad Program (EAP) or UCSD's Opportunities Abroad Program (OAP) while earning credit toward graduation.

EAP participants study in over 100 institutions in 34 countries, many for a full academic year, others for a shorter term. Most EAP programs require a minimum of 3.0 cumulative GPA and junior standing at the time of participation, but there are some exceptions. OAP can assist students in selecting from a range of study, volunteer, internship, and educational travel programs. More information can be found at http://orpheus.ucsd.edu/icenter/pao/.

Academic Internship

Warren College administers an Academic Internship Program available to students from all five colleges. The program is based on the conviction that quality education results from a combination of classroom theory and practical experience. Participants work full- or part-time for a public or private organization. Placements match students' major areas of academic study and correlate with their career goals. Students may enroll one, four, eight, or twelve units per quarter, with a maximum of four internships and/or sixteen units of internship credit. Although most placements are in the San Diego area, the Academic Internship Program is international in scope and varied in offerings. Students might work for a senator in Washington; a legal-aid office in Los Angeles; a business, a T.V. station, research lab or social service agency in San Diego; a public relations firm in London; or any number of other possibilities. Working closely with faculty advisers, students write research papers that integrate their academic backgrounds and internship experience. For more information, see listing under "Academic Internship."

Honors

Quarterly provost's honors, honors at graduation, departmental honors, and Phi Beta Kappa honors are awarded. For additional information see "Honors" in the Index.

Honorary Fellow of the College

Harry N. Scheiber, Historian

Eleanor Roosevelt College

Eleanor Roosevelt is widely regarded as one of the most visionary and influential American public figures of the twentieth century, and her life and achievements continue to inspire men and women everywhere. She was one of the first to champion human and civil rights for all Americans during the Great Depression and the Second World War. After the war, she was the architect of the United Nations Universal Declaration of Human Rights. In the decades that followed, her tireless efforts to promote international understanding and human rights earned her worldwide respect and the title "First Lady of the World."

The College

Eleanor Roosevelt College (ERC) was established in 1988, and is currently home to more than 3,200 men and women. The college serves students interested in pursuing academic excellence, establishing the groundwork for future success, and becoming lifelong learners and effective world citizens.

ERC fosters the ideal of a comprehensive education that develops intellectual capacities and expands general knowledge. The core curriculum exposes students to a variety of academic disciplines, providing a foundation that is suitable for all majors, whether in the natural or applied sciences, the social sciences, or the humanities and the arts. It prepares students for opportunities to study and conduct research with UCSD faculty and scholars.

The world in which today's students will make their careers is one of rapid scientific and technological change, rich cultural diversity, and intense social and political interactions. ERC's general-education curriculum and co-curricular programs build knowledge of other cultures and skills for working in the rapidly changing environment of the twenty-first century. Students seeking careers in fields as diverse as business, law, medicine, public policy, engineering, the sciences, and the arts or humanities find ERC's curriculum and programs equally valuable and relevant.

At ERC, shared educational goals are pursued in a supportive community where students are valued and respected, where they are challenged and helped to succeed, and where they can develop independence and confidence about their roles in society.

General Education

The general-education requirements at ERC are designed to provide all students with a broad intellectual foundation. The curriculum offers undergraduates opportunities to learn about the various fields that may be open to them, thus assuring that their choices in selecting a major, pursuing graduate study, or seeking employment will be based on clear understandings about the nature of the work and their own interests and talents.

Advanced Placement Credits

University credit may be granted for College Board Advanced Placement Tests on which a student earns a score of 3 or higher. The credit may be applied toward general-education requirements (approximately half of which can be met by Advanced Placement credit), elective units for graduation, as subject credit for use in a minor, or as a prerequisite to a major. For further details, see the advanced placement chart in "Undergraduate Admissions, Policies and Procedures."

ERC academic counselors provide information about advanced placement or courses that meet the general education requirements of the college. Students should take advantage of the counseling available in the Academic Advising Office to help them effectively incorporate the college general-education requirements into their academic program.

ERC General-Education Requirements for Students Entering as Freshmen

The Making of the Modern World (six quarters)

This interdisciplinary sequence of six courses incorporates humanities (literature, history, and philosophy) and social sciences as well as writing. The courses examine Western and non-Western societies, cultures, and state systems both historically and comparatively. The Making of the Modern World (MMW) is taught by faculty from many disciplines, including anthropology, history, literature, political science, and sociology.

MMW is designed to help students search for connections—between past and present, among the societies and civilizations that have inhabited the earth, and among the ways that humans have used to make sense of their experience.

At ERC, the university writing requirement is met through MMW and relies on those courses for its content. Instruction and practice in writing, in turn, help students master the course content and analyze and synthesize the material. In all fields, written communication skills are among the most important qualifications graduates take to the job market and graduate school. Writing is assigned in MMW 2–6; the second and third quarters include intensive writing instruction and carry two additional units of credit. For more details, see "The Making of the Modern World" in the department listings.

Natural Sciences (two quarters)

Two courses are to be chosen from selected offerings in biology, chemistry, physics, and/or earth sciences.

Quantitative Methods (two quarters)

Two courses are to be chosen from selected offerings in pre-calculus, calculus, statistics, symbolic logic, or computer programming.

For students majoring in scientific fields, these courses are preparation for major study; for students who will continue their studies outside the sciences, they provide a basic understanding and appreciation of methods and developments in the fields. Many of the selected courses are designed for non-science majors.

Foreign Language (zero to four quarters)

ERC students are required to demonstrate basic conversational and reading proficiency in a modern foreign language, or advanced reading proficiency in a classical language, by completing the fourth quarter of foreign language instruction (or equivalent) with a passing grade.

Students may also complete this requirement by demonstrating advanced language ability on a special proficiency exam. Students considering this option should consult with an ERC academic counselor during their first year at UCSD.

Advanced placement scores in language or literature, and IB scores in language, may exempt

students from all or part of the ERC language requirement.

College-level language study is a prerequisite for study abroad in most non-English speaking countries and enhances understanding of those societies. Students wishing to study abroad in non-English speaking countries may need to take additional language classes, and will need to take all language courses for letter grades.

Fine Arts (two quarters)

Two four-unit courses are required, to include study of both Western and non-Western music, theatre, dance, and/or visual arts. These courses help students appreciate the rich range of human expression to be found in cultures and ages other than their own.

Regional Specialization (three quarters)

Each ERC student selects three courses dealing with a single geographic region of the world. The college has defined regions broadly enough to assure course availability and narrowly enough to ensure coherence of subject matter. These courses may be chosen from offerings in humanities, social sciences, and fine arts. At least two of the three must be taken at the upper-division level. See "Minors" below about application of this course work to an optional ERC minor.

Upper-Division Writing Requirement

To demonstrate competency in written English at the upper-division level, students submit to the Academic Advising Office a paper or papers of specified lengths that were written for one or more upper-division courses and graded C– or higher. Papers are returned to students after Academic Advising Office staff certify that they meet the upper-division writing requirement.

Sample Program

A program like the sample one shown here would lead to completion of most general-education requirements during the first two years of college. Some variation will occur depending upon a student's academic preparation, choice of major, and individual interests and priorities. For example, students planning to major in science, math, or engineering will be taking many prerequisite courses for their major; those courses typically also fulfill the general-education requirements in natural sciences and/or quantitative methods.

FALL	WINTER	SPRING
FRESHMAN YEAR		
MMW 1	MMW 2	MMW 3
foreign language	foreign language	foreign language
fine art	quantitative methods	quantitative methods
Subject A, major, or elective	fine art	major or elective
SOPHOMORE YEAR		
MMW 4	MMW 5	MMW 6
natural science	natural science	major or elective
major or elective	major or elective	major or elective
major or elective	major or elective	regional specialization
JUNIOR AND SENIOR YEARS		
regional specialization (2)		
major course work		
electives		

Transferring to ERC

Transfer students may meet most ERC general-education requirements before entering UCSD if they have followed articulation agreements with community colleges, or taken courses elsewhere that ERC deems equivalent in content to UCSD courses that meet the college's requirements.

All transfer students must take three quarters of MMW, and it is recommended that the three courses be taken in sequence. Students who have not met their freshman writing requirement elsewhere must complete it by taking MMW 2 and/or MMW 3 as part of this three-course requirement.

All transfer students must also take two upper-division regional specialization courses and satisfy the upper-division writing requirement. See "Graduation Requirements" below.

Grading Options

1. No more than 25% of total UCSD units counted in satisfaction of degree requirements may be taken on a Pass/Not Pass basis.
2. Electives may be taken on a Pass/Not Pass basis except if they are to be applied to majors or minors. Check with the appropriate department or college for rules applying to specific majors or minors.
3. Courses that meet the following ERC general-education requirements may be taken Pass/Not Pass: fine arts, foreign language, natural sciences, quantitative methods, and one regional specialization course. All other general-education courses must be taken for letter grades.

Leadership and Community

ERC students are recognized for their strong sense of community. These bonds are created in part by common classroom experiences in MMW. They also grow from shared explorations in a variety of college programs in which students take active roles: college and campus-wide student government, service to the campus and the larger community, the acquisition of leadership skills, and sports and social activities.

The college is home to UCSD's International House, which offers informative and dynamic discussions for the campus community at its weekly International Affairs Group meetings. ERC also hosts (with the Programs Abroad Office) a retreat each fall to welcome back study abroad returnees from all six colleges and assist with their re-integration into the UCSD community.

Expanding Horizons

Students whose interests extend beyond our borders are encouraged and assisted in finding opportunities to spend part of their college career in another country. There are many options, including short-term or year-long academic programs, work opportunities, and career-related internships.

At one time or another, men and women from ERC have studied in more than forty different countries in Europe, Africa, Latin America, the Middle East, and Asia.

Students on university financial aid who participate in the UC Education Abroad Program pay UCSD fees and retain their financial aid packages, which are budgeted to include study abroad expenses. In addition, there are a number of sources for scholarship aid designated for study abroad.

Majors

An ERC student may pursue any of the approximately 125 undergraduate majors offered at UCSD. Students may complete more than one major, provided they comply with all Academic Senate regulations concerning double majors. To declare a double major, a student must have accrued at least ninety but no more than 135 units, have at least a 2.50 GPA, and meet university requirements regarding total maximum number of units earned and quarters attended at UCSD.

Most majors require the completion of specified "pre-major" or prerequisite courses at the

lower-division level before enrollment in upper-division major courses. For some majors, admission to upper-division course work is contingent upon a satisfactory GPA in certain pre-major courses. Students are strongly encouraged to work closely with department advisers as well as college academic counselors to assure adequate and timely preparation for their majors.

Completion of certain majors may take more than four years or the minimum 180 units required for graduation. Time-to-graduation in other instances may be affected by a student's level of preparation for upper-division work in the major or by a decision to change major. See "The Undergraduate Program(s)" in respective department listings.

ERC Individual Studies Major

ERC offers an Individual Studies major to meet the needs of students who have defined academic interests for which suitable majors are not offered at UCSD. Students who find themselves in this situation should consult a college academic counselor at the first opportunity.

This major includes regular course work and often independent study, representing a minimum of twelve upper-division four-unit courses. A regular member of the faculty serves as adviser to the student. Students admitted to the Individual Studies major may enroll in ERC 199, an independent study course supervised by a faculty member, who tailors the content to fit the major.

Qualifying seniors pursuing an Individual Studies major may undertake an honors thesis research project (ERC 196) under the tutelage of their faculty mentor. See "Eleanor Roosevelt College" in the department listings.

Further information about an Individual Studies major may be obtained from the ERC Academic Advising Office.

Minors and ERC Special Minors

Minors are not required at ERC. However, completion of a minor can be an educational or pre-professional asset. All students have the option of completing any approved departmental or inter-departmental minor.

Alternatively, students may wish to combine foreign language course work with an associated regional specialization to earn an ERC Special Minor in, for example, Asian Studies or Middle Eastern Studies. Such minors must conform to Academic Senate policies: For students entering the University before January 1998, this means completion of at least six courses (twenty-four units), of which at least three (twelve units) must be at the upper-division level. Students entering in January 1998 or later must complete at least seven courses (twenty-eight units), of which at least four (sixteen units) must be at the upper-division level. Upper-division courses applied toward a minor may not be used to meet the requirements of the major.

Internships

As a way to combine classroom theory and practical experience, juniors and seniors are encouraged to consider internships under programs available to any UCSD student and administered by the Academic Internship Program, Career Services, or UCSD Associated Students.

Participants work for various lengths of time in enterprises that match their major interests and career goals. Most placements are local, but some are in such locations as Washington, D.C., Sacramento, Los Angeles, or London.

Working with faculty advisers, students enrolled in academic internships write research papers integrating their work experience with their formal studies, and they can earn up to sixteen units of credit in increments of four, eight, or twelve per quarter.

Graduation Requirements

To graduate with a baccalaureate degree from the University of California, an Eleanor Roosevelt College student must:

1. Satisfy two University of California requirements: the Subject A requirement in English composition and the American History and Institutions requirement. See "Undergraduate Admissions, Policies and Procedures."
2. Fulfill the ERC general-education requirements as described.
3. Complete an approved departmental or inter-departmental major, meeting all requirements as specified by the major department or program.
4. Satisfy the senior residency requirement that thirty-five of the final forty-five units must be completed as a registered UCSD student. Students studying abroad in their senior year may petition to have this requirement waived.
5. Complete and pass a minimum of 180 units for the Bachelor of Arts or Bachelor of Science degree. At least sixty of those (fifteen courses) must be at the upper-division level. The B.S. degree is awarded in biology, physics, cognitive science, chemistry, earth sciences, management science, and designated engineering and psychology programs; the B.A. is awarded in all other majors.
6. Earn a cumulative GPA of 2.0 or higher.

Honors Recognition

Students who earn a quarter GPA of 3.5 or higher are notified by letter of having achieved Provost's Honors. Students who maintain GPAs of 3.5 or higher for a full academic year are awarded Provost's Honors certificates.

Every spring, ERC holds an academic honors recognition event to which high achieving students are invited, and graduating seniors are encouraged to invite individual faculty as their guests.

Also each spring, UCSD's chapter of the Phi Beta Kappa Society invites to membership seniors who have demonstrated outstanding academic achievement (3.65 GPA), breadth in their academic programs (including humanities, language, and quantitative methods), and good character, among other criteria. See "Phi Beta Kappa" in the index.

At Commencement, ERC graduates with extraordinarily outstanding overall academic records are named Provost's Scholars. Graduates with final cumulative GPAs equivalent to approximately the top 14 percent of UCSD graduates become eligible for University Honors and receive their degrees Cum Laude (with honors), Magna Cum Laude (with high honors), or Summa Cum Laude (with highest honors).

ERC Honors Program

The Freshman and Sophomore Honors programs at ERC have been established to provide exceptionally motivated and capable students with enhanced educational experiences in association with faculty and other honors students.

Selected new students are invited to enroll in the Freshman Honors Seminar. During fall quarter, students meet with a variety of faculty members to learn more about their research and about academic enrichment opportunities at UCSD. Seminar members also participate in other enriching academic and cultural events.

The Freshman Honors Seminar continues during winter quarter (and some years through spring quarter) with faculty speakers who focus on international themes. In winter (and spring) quarters, these seminars carry one unit of credit each (ERC 20). See "Eleanor Roosevelt College" in the department listings.

Sophomores who have earned cumulative grade-point averages (GPAs) of 3.5 or higher have opportunities to pursue independent study with individual faculty for credit (ERC 92). See "Eleanor Roosevelt College" in the department listings.

Additional honors opportunities are offered in MMW. Students with excellent grades in MMW 1, 2, and 3 and high cumulative GPAs are eligible to take honors sections of MMW (4H, 5H, and 6H). These students attend regular MMW lectures and meet in separate honors discussion sections. They also attend special guest lectures and enrichment activities related to course content.

At the upper-division level, students may qualify to enroll in honors programs offered by their major departments. These programs usually include research under the direction of a faculty mentor and the writing and presentation of an honors thesis.

Sixth College

The theme of Sixth College, *Culture, Art, and Technology,* was motivated by the rich intellectual challenges inherent in the intersection of technology, culture, and the arts. The educational philosophy exploits the college theme to create a curriculum that will prepare students for a future that demands ethical integrity; teamwork skills; ability to adapt to rapid change; aptitude to think abstractly; the competence to acquire, process, and evaluate new information critically; and the proficiency to communicate across disciplinary boundaries. To achieve this goal, Sixth College will create a learning environment, both inside and outside the classroom, which will emphasize collaborative learning, pattern recognition, deductive reasoning and creative imagination, and the ability to hypothesize, interpret, and express thoughts and ideas through the effective use of communication tools that include the digital medium. Sixth College will provide the skills necessary for lifelong learning, including fluency with information technology and information literacy, and the crucial ability to seek out and learn from experts.

On campus and off, students will be linked in many ways—by digital media, by social and local engagement, by cultural and intellectual projects—so that Sixth College becomes an identifiable, sustaining community that is always reaching out to others.

A fundamental underpinning of the Sixth College philosophy is to create a sense of students' connectedness to the college, to UCSD, and the community at large by creating virtual communities. For example, we will create "Study Rooms" that will include a series of short video streamed lectures. The user will be able to watch and listen to a professor's lectures in any order, and each lecture will feature visual images, outlines, and charts to enrich the user's understanding and enjoyment. Along with the illustrated lectures, the study room will link students to an array of Web sites selected by the faculty as sources of additional information. Each room will have a reference section, with an annotated list of suggested books, articles, journals, films, and other ancillaries prepared by the faculty.

Sixth College challenges students to examine the multi-dimensional interactions between culture, art, and technology, in order to imagine the future and create new forms of inquiry and communication. Teamwork, artistic expression, interdisciplinary ways of thinking and knowing, and multicultural awareness are core educational goals.

Sixth College students will be encouraged to engage with the outlying community. More than an ethical obligation to service, such an engagement is integral to the process of learning to listen across cultures and to consider implications of diverse agencies of change. Sixth College is committed to pioneer meaningful application of evolving technologies inside and outside the classroom. For example, wireless communication technology will be incorporated into the very design of this college's physical infrastructure and curricular planning, allowing Sixth College to pioneer radically new teaching, communication, community, and life-long learning paradigms. The Sixth College community will collectively and consistently be reflecting upon itself. Through "Active Research," students may study how they and their Sixth College companions learn in and beyond the classroom. This research will become the basis for shifts in the curriculum, teaching methods, modes of administration, and residence hall culture. Our students will help continuously transform Sixth College.

Culture, Art, and Technology

All students will take a three-quarter core sequence titled Culture, Art, and Technology (CAT). CAT is a highly interdisciplinary sequence integrating learning in arts and humanities, social sciences, and science and engineering. It introduces students to thinking across disciplines so they can identify interactions, recognize patterns, and provide opportunities for learning by inquiry in a collaborative environment. Exercises and instruction that develop fluency with information technology and information literacy, as well as writing and communication skills, will be embedded in the core sequence.

General-Education Requirements

The Sixth College breadth requirements have three primary goals: (1) to produce breadth of knowledge and connections across that breadth, (2) to encourage creative imagination, and (3) to accomplish these activities from an ethically informed perspective. The aim is to allow students to discover the richness of UCSD's academic life and to see relationships among the sciences, social sciences, engineering, arts, and the humanities. Because Sixth College emphasizes cross-disciplinary ways of thinking, it is critical for students to appreciate the different modes of inquiry within academic disciplines. For information about courses available to satisfy the general-education requirements, please visit the academic advising office in the Sixth Administration Building or check the Web site at sixth.ucsd.edu.

1. **Culture, Art, and Technology:** Three courses. Core Sequence CAT 1, 2, and 3. Includes two (6 unit) quarters of intensive instruction in university-level writing.
2. **Computing Requirement:** One course. This requirement may be satisfied with courses from a variety of departments, including CAT 4.
3. **Modes of Inquiry:** Seven courses. Two courses in social sciences, two courses in humanities, two courses in natural sciences, one course in math/logic (different options available for science and non-science majors).
4. **Understanding Data:** One course in statistical methods (different options available for science and non-science majors).
5. **Societal and Ethical Contexts:** Two courses. One course in ethnic or gender studies AND one course in ethics.
6. **Art Making:** Two courses in literature , music, theatre (including dance), or visual arts.
7. **Practicum:** Students must complete an upper-division project, and present the project with a two-unit course in Practicum Communication. See the Sixth College advising center for details. For B.A. and B.S. degrees in arts and sciences, at least eleven of the general education courses must lie outside the requirements specified by one of the student's major departments or programs. For B.S. degrees in engineering, at least nine of the courses must lie outside the major requirements.

Graduation Requirements

In order to graduate from Sixth College all students must:

1. Satisfy the University of California requirements in Subject A and American History and Institutions (See Academic Regulations: Subject A; and American History and Institutions).
2. Satisfy the general-education requirements.
3. Successfully complete a major according to all regulations of that department.
4. Complete a minimum of fifteen upper-division courses (60 units).
5. Pass at least 180 units for the B.A./B.S. degree. No more than 3 units in physical education (activity) courses may count toward graduation.
6. Attain a C average (2.0) or better in all work attempted at the UC. Departmental require ments may differ. Students are responsible for checking with the department of the major for all regulations.
7. Meet the senior residence requirement. (See Academic Regulations: Senior Residence).

Transfer Students

Transfer students will be admitted to Sixth College beginning in fall 2004. Please see an academic counselor at Sixth for details.

Majors and Minors

Majors: Sixth College students may pursue any of the departmental or interdisciplinary majors offered at UCSD. The majority of the academic departments have established lower-division prerequisites. Generally, these prerequisites must be completed prior to entry into upper-division major courses. Many of these courses may count for general-education credit as well. Students are strongly encouraged to work closely with department faculty and college advisers. For details on the specific major departments, refer to the "Courses, Curricula, and Programs of Instruction" section of this catalog.

Minors are optional. However, students are encouraged to keep as many options open as possible. A minor provides an excellent opportunity to complement the major field of study. Students are required to complete twenty-eight units of interrelated work, of which at least twenty units must be upper-division.

Pass/Not Pass Grading Option

Some general-education requirements may be fulfilled by courses taken on the Pass/Not Pass basis. Sixth College students are reminded that major requirements and prerequisites must be taken on a graded basis. In accordance with University Academic Regulations, the total number of Pass/Not Pass units may not exceed one-fourth of a student's total UCSD units.

Honors

Quarterly provost's honors, honors at graduation, departmental honors, and Phi Beta Kappa honors are awarded. For additional information see "Honors" in the index.

Undergraduate Admissions, Policies and Procedures

All communications concerning pre-applicant undergraduate admission for U.S. citizens should be addressed to:

Office of Admissions and Relations with Schools
Student Affairs
University of California, San Diego,
9500 Gilman Drive, Dept. 0021,
La Jolla, California 92093-0021.
Email: admissionsinfo@ucsd.edu
Telephone: (858) 534-4831
Web site: admissions.ucsd.edu

Definitions

An application to the University of California, San Diego is processed and evaluated as a freshman or transfer, California resident; freshman or transfer, nonresident; or freshman or transfer, international applicant. See definitions below:

An Undergraduate Applicant

A student who wishes to complete a program of studies leading to a bachelor of arts or a bachelor of science degree.

A Freshman Applicant

A student who has graduated from high school but who has not enrolled since then in a regular session in any accredited college-level institution. This does not include attendance at a summer session immediately following high school graduation.

A Transfer Applicant

A high school graduate who has been a registered student in another accredited college or university or in college-level extension classes other than a summer session immediately following high school graduation. A transfer applicant may not disregard his or her college record and apply for admission as a new freshman.

An undergraduate student can earn transfer credit upon successful completion of college-level work which the university considers consistent with courses it offers. Such credit may be earned either before or after high school graduation. The acceptability of courses for transfer credit is determined by the Office of Admissions and Relations with Schools.

For more information regarding transferring to UCSD call or write:

University of California, San Diego
Transfer Student Services
Office of Admissions and Relations with Schools
Student Affairs
9500 Gilman Drive, Dept. 0021,
La Jolla, California 92093-0021
(858) 534-4831
Email: admissionsinfo@ucsd.edu
Web site: admissions.ucsd.edu/transfer

A Nonresident Applicant

A student who lives outside the state of California and who is required to present a higher scholarship average than is required of California residents to be eligible for admission to the university, in addition to paying the nonresident tuition fees.

An International Applicant

A student who holds or expects to hold any nonimmigrant visa.

Educational Opportunity Programs

The Educational Opportunity Program (EOP) is a recruitment and academic support program established by the university to increase the enrollment of educationally disadvantaged and low-income students. Students are provided with pre-admission counseling, and academic and personal support services. EOP eligibility is based on family income level.

Services available to EOP students cover a broad range of needs. Recruitment and application-related services include pre-admission counseling, application fee waivers, application follow-up, and deferral of the Statement of Intent to Register fee. Academic support for EOP students is offered through the Office of Academic Support and Instructional Services (OASIS).

The preferred method of applying is online at http://www.universityofcalifornia.edu/admissions/undergradapp/. Copies will also be available at California high schools and community colleges, as well as at all UC campuses. EOP applicants must be California residents. To apply for EOP, check the appropriate box in the UC application designated for the Educational Opportunity Program. Fill in the information requested in the application pertaining to family size and income, parental education level and occupation. This information is used in conjunction with other information from the admission application in determining eligibility for EOP.

Financial aid is available to eligible EOP students from the regular state, federal, and university sources administered through the UCSD Financial Aid Office. Although EOP eligibility does not guarantee financial aid, the low-income ceilings for EOP eligibility mean that most EOP applicants should qualify for substantial financial assistance. Financial aid information is available from the UCSD Financial Aid Office. Admissions information can be sought from your high school or community college counselor or the Office of Admissions and Relations with Schools. For additional information about EOP eligibility requirements, program services, or general information regarding UCSD, call or write:

University of California, San Diego
Office of Admissions and Relations with Schools
Student Affairs
9500 Gilman Drive, Dept. 0021, La Jolla,
California 92093-0021
(858) 534-4831
Email: admissionsinfo@ucsd.edu
Web site: admissions.ucsd.edu

Undergraduate Colleges and Majors

COLLEGES

Even though you may be uncertain about your major, your application for admission must include the name of the UCSD college with which you plan to affiliate (Revelle, John Muir,

Thurgood Marshall, Earl Warren, Eleanor Roosevelt or Sixth College). You must indicate a second and third choice in the event your first choice college closes early. Applicants may be reassigned to another college by the Office of Admissions and Relations with Schools if enrollment quotas prohibit first choice. Applicants who do not indicate a UCSD college preference will be assigned a college.

In the "Choosing a College" section, which describes the educational philosophies of the six colleges at UCSD, you will find information concerning the requirements of each college. It is very important that you read that section of the catalog carefully, and that you decide which of the colleges is the right one for you.

You can also find information about UCSD's six colleges, and much more, on the Web site of the Office of Admissions and Relations with Schools (http://admissions.ucsd.edu).

IMPACTED MAJORS

It sometimes becomes necessary to limit enrollment in certain majors. When this occurs the affected majors will be listed in the *General Catalog* as soon as possible. When the catalog does not reflect these conditions, newly admitted students will be notified of them in the university's admissions letter. Currently, the following majors are considered impacted for freshmen: computer science, and computer engineering (within the computer science and engineering department); electrical engineering, and computer engineering (within the electrical and computer engineering department), bioengineering and bioengineering: biotechnology. Freshmen considering applying to these majors must also select an alternate major on the UC application. Students admitted to UCSD who are not admitted directly into one of these majors will be admitted into their alternate major, provided it is not impacted.

PRE-MAJORS

The following majors admit freshmen to pre-major status only: bioengineering: premedical, engineering physics, human development, ICAM-visual arts, ICAM-music, literature/writing, math-computer science, visual arts-media (computing emphasis).

As a pre-major, you must satisfy all prerequisites before admission to the major. The set of conditions, determined on a department-by-department basis, and approved by the San Diego Committee on Educational Policy, is explained in detail under the department listing in this catalog.

Other departments may be approved to offer pre-majors by the Committee on Educational Policy subsequent to this publication. Please refer to "Major Fields of Study" in the introduction to the catalog.

Undergraduate Admissions

MINIMUM REQUIREMENTS

The university's minimum undergraduate admission requirements, which are the same on all University of California campuses, are based on three principles. They are: (1) the best predictor of success in the university is high scholarship in previous work; (2) the study of certain subjects in high school gives a student good preparation for university work and reasonable freedom in choosing an area for specialized study; and (3) standardized assessment tests provide a broad base for comparison, and mitigate the effects of differing grading practices.

It is important to understand that the academic requirements for admission are minimum entrance standards. Completing the required high school courses with satisfactory grades will not automatically determine whether you will be selected for admission to UCSD, as students are chosen from a large number of highly competitive applicants. Most of these applicants will have greatly exceeded the minimum requirements; therefore, selection depends on additional factors.

Academic preparation is the principal basis for gaining admission to UCSD. Students are encouraged to pursue the most rigorous academic curriculum possible, including honors and Advanced Placement (AP) courses, in order to prepare for the university experience. High test scores are necessary in conjunction with strong performance in classes and a consistent pattern of courses. Overall performance must be well above minimum requirements in order to admit you to the campus and major of your choice.

UCSD Admission Policy and Selection Criteria

The undergraduate admission policy at the University of California, San Diego is designed to select a highly qualified and diverse student body. As a major public institution of higher education serving the teaching, research, and public service needs of California, UCSD strives to reflect the diversity of the population of the state. This undergraduate admission policy has been developed by the San Diego campus in compliance with the University of California Policy on Undergraduate Admissions that "seeks to enroll a student body that, beyond meeting the University's eligibility requirements, demonstrates high academic achievement and exceptional personal talent, and that encompasses the broad diversity of California."

Freshman Selection

In recent years, the number of applicants has far exceeded the number of spaces available, and it has become necessary to adopt standards which are much more demanding than the minimum requirements to admit students. The San Diego campus has developed the following procedures for the selection of applicants to be admitted from its pool of eligible candidates:

COMPREHENSIVE REVIEW

All UC eligible applicants will receive a review which considers a combination of academic and personal achievement factors, including:

- Uncapped grade-point average (maximum of eight semesters of approved honors, AP/IB HL, or transferable college-level courses)
- Scores of all required examinations
- Number of "a-g" courses beyond the minimum specified for UC eligibility
- Eligibility in the Local Context (ELC)
- Educational environment
- Low family income
- First-generation college attendance
- Demonstrated leadership
- Special talents, achievements, and awards
- Volunteer/community service
- Sustained participation in pre-collegiate/motivational and enrichment programs
- Special circumstances and/or personal challenges

Applicants with the highest level of academic and personal achievement will be admitted according to the number of spaces available to incoming UCSD freshmen.

Advanced-Standing Selection

Admitted applicants will be selected primarily on the basis of academic performance, as assessed by review of the GPA in all UC-transferable courses and the total number of UC-transferable units completed one full term prior to the initial quarter of attendance at UCSD.

Applicants who have satisfactorily completed sixty transferable semester units (ninety quarter units) one full term prior to the term of admission will be considered for admission. California community college applicants must have a competitive GPA (based on the strength of the applicant pool) in UC-transferable courses. Highest priority for admission is given to upper-division transfer students from California community colleges, followed by upper-division transfer students from other UC campuses, upper-division California resident transfer students from other two-year or four-year institutions, and upper-division transfer students who are not residents of California.

More than 95 percent of UCSD's transfer students come from California community colleges. A California community college applicant is defined as follows: a student who was enrolled at one or more California community college campuses for at least two terms, excluding summer sessions; the last college the student attended before admission to a UC campus was a California community college; and the student has completed 30 semester (45 quarter) UC-transferable units at one or more California community colleges.

Admission as a Freshman Applicant

MINIMUM REQUIREMENTS

To be eligible for admission to the university as a freshman you must meet the high school diploma requirement, the subject requirement, the scholarship requirement, and the examination requirement, which are described below.

HIGH SCHOOL DIPLOMA REQUIREMENT

You must earn a diploma from a high school in order to enter the university as a freshman. The Certificate of Proficiency, awarded by the California State Department of Education upon successful completion of the High School Proficiency Examination, proficiency tests from other states, and the General Education Development (GED) certificate, will be accepted in lieu of the regular high school diploma. Subject, scholarship, and examination requirements discussed below must also be met.

SUBJECT REQUIREMENT

A student applying for admission as a freshman to the University of California must have completed a minimum of fifteen units of high school work during grades nine through twelve. At least seven of the fifteen units must have been earned in courses taken during the last two years of high school. (A one-year course is equal to one unit; a one-semester course is equal to one-half unit.)

These units must have been earned in academic or college preparatory courses, as specified below. Lists of approved courses are compiled by the UC Office of the President for high schools in California. Lists are specific to each high school and are available through your high school's counseling office, and on Web site (http://www.ucop.edu/doorways). A detailed description of the "a-g" requirements can be found at http://pathstat1.ucop.edu/ag/a-g. Applicants from high schools outside California may find the following guidelines helpful in determining acceptability of courses.

Specific "a-g" Course Requirements

(a) **HISTORY/SOCIAL SCIENCE**

Two units (equivalent to two yearlong courses or four semesters) are required. Coursework must include:

World History, Cultures, and Geography—One year, which can be met by a single integrated course or by two one-semester courses; and

U.S. History/American Government (Civics)—One year of U.S. History, or one-half year of U.S. History combined with one-half year of American government (civics)

(b) **ENGLISH**

Four units (equivalent to four yearlong courses or eight semesters) of college preparatory composition and literature are required. **Both reading and writing components must be included in the courses.**

Reading—Acceptable courses must require extensive reading of a variety of literary genres, including classical and/or contemporary works. Reading assignments must include full-length works. Excerpts from anthologies, articles, etc., can be supplemental but cannot constitute the main component of reading assignments.

Writing—Courses must also require substantial, recurrent practice in writing extensive, structured papers. Student must demonstrate understanding of rhetorical, grammatical, and syntactical patterns, forms, and structures through responding to texts of varying lengths in unassisted writing assignments.

(c) **MATHEMATICS**

Three units (equivalent to three one-year courses) of college preparatory mathematics are required. Four units are strongly recommended.

Elementary Algebra

Geometry—Courses must include topics in two- and three-dimensional geometry.

Advanced Algebra

(d) **LABORATORY SCIENCE**

Two units (equivalent to two one-year courses) of laboratory science are required (three units are strongly recommended) by a course that either

1. Covers the core concepts in one of the fundamental disciplines of biology, chemistry, or physics; or
2. Has as a prerequisite of biology, chemistry, or physics, and builds upon that knowledge. Such a course may include elements of another scientific discipline.

(e) **LANGUAGE OTHER THAN ENGLISH**

Two units (equivalent to two one-year courses) of coursework in a single language. Three units are recommended.

Minimum Performance Objectives—Courses should emphasize speaking and understanding, and include instruction in grammar, vocabulary, reading, and composition. At this level, emphasis should not be on the ability to describe grammatical features of the language. The minimum performance objectives after two years of high school study should be the following:

- The ability to sustain a brief conversation on simple everyday topics demonstrating good use of the whole sound system (good pronunciation), and the basic structural patterns in the present, past, and future tenses, the subjunctive, and commands.
- Summarize orally and in writing, the main points of a relatively simple reading passage not involving specialized vocabulary

Classical languages (Latin, Greek) and American Sign Language (ASL) are acceptable to fulfill the (e) requirement.

(f) **VISUAL AND PERFORMING ARTS**

One unit (equivalent to one yearlong or two semester courses) required in any of the following categories: dance, drama/theater, music, or visual art.

Intention—To provide a meaningful experience and breadth of knowledge of the arts. Approved VPA courses must be directed at acquiring concepts, knowledge, and skills in the arts disciplines.

Prerequisites—Acceptable courses need NOT have any prerequisite courses.

Co-Curricular Work—Work outside class must be required: for example, portfolio/performance preparation, reading, writing, research projects, and/or critical listening/viewing.

Course Standards—Courses should provide students with an experience that implements the intent of the California State Board of Education approved Visual and Performing Arts (VPA) Content Standards. Each VPA course shall sufficiently address the state content standards under all five component strands:

1. Artistic Perception
2. Creative Expression
3. Historical and Cultural Context
4. Aesthetic Valuing
5. Connection, Relations, and Application

(g) **COLLEGE PREPARATORY ELECTIVE COURSES**

One unit (equivalent to two semester courses) is required. Course(s) can be taken in 9–12 grades but must fall within the following subject areas: visual and performing arts, history, social science, English, advanced mathematics, laboratory science, and language other than English.

Intent—To encourage prospective UC students to fill out their high school programs with courses that will meet one or more of a number of objectives:

* To strengthen general study skills, particularly analytical reading, expository writing, and oral communications;
* To provide an opportunity to begin work that could lead directly into a major at the university; and
* To experience new areas of academic disciplines that might form the basis for future major or minor studies at the university.

Quality—All courses are expected to meet standards of quality similar to those required for the "a–f" requirements.

Advanced Level—While it is preferred that elective courses would be at an advanced and/or specialized level, introductory courses in all of the required academic disciplines are acceptable.

Alternatives—Courses such as political science, economics, geography, humanities, psychology, sociology, anthropology, journalism, speech or debate, computer science, computer programming, and others may also qualify. In addition, courses that are interdisciplinary, drawing knowledge from two or more of these fields, are also acceptable. Approved alternative courses must provide academically challenging study at the same level as advanced courses in the "a-f" subject matter fields. These elective courses must be at the eleventh or twelfth grade level, have appropriate prerequisites, and present material at a sufficient depth to allow students to achieve mastery of

ELIGIBILITY INDEX

CALIFORNIA RESIDENTS

"a-g" GPA	SAT I Total	"a-g" GPA	Test Score Total
2.80–2.84	4640	3.20–3.24	3408
2.85–2.89	4384	3.25–3.29	3320
2.90–2.94	4160	3.30–3.34	3248
2.95–2.99	3984	3.35–3.39	3192
3.00–3.04	3840	3.40–3.44	3152
3.05–3.09	3720	3.45–3.49	3128
3.10–3.14	3616	≥ 3.50	3120
3.15–3.19	3512		

NONRESIDENTS

"a-g" GPA	Test Score Total
3.40–3.44	3152
3.45–3.49	3128
≥ 3.50	3120

SAT Total equals: [SAT I composite] + [2 x (SAT II writing + SAT II math + third SAT II)]. SAT I composite is highest combined mathematics and verbal scores from a single sitting. Highest individual SAT II scores, from any sitting, will be considered. See adjacent table to convert an ACT score to an SAT I composite.

ACT to SAT 1 Conversion Table

ACT	Equivalent SAT I Score	ACT	Equivalent SAT I Score
36	1600	23	1070
35	1580	22	1030
34	1520	21	990
33	1470	20	950
32	1420	19	910
31	1380	18	870
30	1340	17	830
29	1300	16	780
28	1260	15	740
27	1220	14	680
26	1180	13	620
25	1140	12	560
24	1110	11	500

fundamental knowledge that prepares them for university work or a future career path.

Courses Satisfying the "g" Requirement

History: Courses should enable students to establish a breadth of understanding of history and should provide an understanding of the human past, including its relation to the present. Courses should develop a student's ability to think critically, to evaluate historical data, and to analyze and synthesize evidence. All history courses should require extensive reading and writing.

Social Science: Courses should be in one of the social sciences: anthropology, economics, geography, political science, psychology, or sociology. Courses could also be interdisciplinary in nature, drawing knowledge from two or more of these fields. Course objectives should include as many of the following as are applicable to the field: (1) an understanding of the development and basic features of major societies and cultures, (2) an examination of the historic and contemporary ideas that have shaped our world, (3) an understanding of the fundamentals of how differing political and economic systems function, (4) an examination of the nature and principles of individual and group behavior, and (5) a study of social science methodologies. A social science course must include a body of basic knowledge, extensive reading, and written and oral exposition. Courses that are designed to meet state-mandates social studies graduation requirements are acceptable provided that they meet the above criteria. Courses with applied, service, or career-related content are acceptable only if those components are used to augment the strong academic content of the course.

English: Courses should require substantial reading with frequent and extensive practice in writing that is carefully evaluated and criticized, as noted in the "b" English requirement (above). Courses in journalism, speech, debate, creative writing, or advanced-level ESL are acceptable electives if they meet the general requirements in reading and writing stated above.

Advanced Mathematics: Courses with second-year algebra as a prerequisite such as trigonometry, linear algebra, pre-calculus (analytic geometry and mathematical analysis), calculus, probability, and statistics are acceptable. A computer science course is acceptable if it fulfills the following objectives: (1) enables students to express algorithms in a standard language; (2) requires students to complete substantial programming projects; and (3) involves the study and mastery of various aspects of computer science (e.g., how computers deal with data and instructions, the internal components of a computer, and the underlying computer logic).

Laboratory Science: Acceptable courses should cover topics from the biological or physical sciences and include laboratory activities. A terminal course designed only to meet graduation requirements is not acceptable.

Language Other Than English: Elective courses in the same language used to satisfy the "e" requirement must have at least two years of the language as a prerequisite. In order for a second language other than English to qualify as an elective, at least two years of this language must be completed.

Visual and Performing Arts (VPA): Advanced courses in the Visual and Performing Arts can meet the "g - Elective" requirement, but must still address the five components of the state VPA standards. Advanced courses should enable students to understand and appreciate artistic expression and, where appropriate, to talk and write with discrimination about the artistic material studied. Courses devoted to artistic performance and developing creative artistic ability, should have prerequisites (either one year of introductory coursework or experience approved by the instructor) and should assume proficiency beyond the introductory level. Courses must require on the average the equivalent of a five-period class per week. Work outside of the class must be required (e.g., portfolio/performance preparation, reading, writing, research projects, and critical listening/viewing). In 2006 and beyond, advanced VPA courses that are a semester in length will only be considered for the "g - Elective" area, not the "f - VPA" area, which must be satisfied by completing an appropriate sequential yearlong course.

HONORS LEVEL COURSES

The University of California encourages students to take demanding advanced academic courses in all fields. Accordingly, the grades in up to four units of eleventh and twelfth grade honors courses will be counted on a scale A=5, B=4, C=3, if these courses are certified by the high school and the University of California as offered at an honors level. Honors credit will also be given for up to two of these four units taken in tenth grade. Grades lower than C do not earn honors credit.

EXAMINATION REQUIREMENT

All freshman applicants must take and submit scores from tests specified below. You must take the tests no later than December of your senior year.

1. One assessment test, either a or b:
   a. Scholastic Assessment Test (SAT I: Reasoning Test)
      Your verbal and mathematics scores on this test must be from the same sitting.
   b. American College Test (ACT)
      The composite score must be submitted.
2. Three Subject Tests (SAT II)

   These must include (a) writing;* (b) mathematics, Level 1 or 2; and (c) one from English literature, foreign language, science, or social studies.

If tests are repeated, the university will accept the highest score received. See your counselor for information and registration forms or write to the College Board ATP, P.O. Box 6200, Princeton, New Jersey 08541-6200; Web site: www.collegeboard.org. For ACT information, write to the ACT Registration Unit, P.O. Box 168, Iowa City, Iowa 52240; Web site: www.act.org.

*The SAT II Subject test in literature may not be substituted.

SUBJECT A EXAMINATION

If the Subject A requirement is not satisfied prior to April 1, admitted students are required to take the university-wide Subject A Examination in mid-May. Notice of this examination will be sent to all admitted students. There will be a $55 fee.

Freshman Eligibility

CALIFORNIA RESIDENTS (MINIMUM REQUIREMENTS)

(Refer also to "Admission as a Freshman Applicant.")

Please be advised that these are minimum eligibility requirements. The San Diego campus has been unable to accommodate all minimally eligible applicants. You must exceed these requirements in order to be considered for admission. See "UCSD Admission Policy and Selection Criteria."

Eligibility Index: An "Eligibility Index" is used to determine minimum eligibility for California applicants. The ACT is acceptable in place of the SAT I. See the conversion chart on page 44.

NON-CALIFORNIA RESIDENTS (MINIMUM REQUIREMENTS)

(Refer also to "Admission as a Freshman Applicant" and "Freshman Eligibility: California Residents.")

Please be advised that these are minimum eligibility requirements. The San Diego campus has been unable to accommodate all minimally eligible applicants. You must exceed these requirements in order to be considered for admission. See "UCSD Admission Policy and Selection Criteria."

Scholarship: An applicant who is not a resident of California is eligible to be considered for admission to the university with a grade-point average of 3.40 or better, calculated on the required high school subjects and achieve a correlating test score indicated in the Eligibility Index (p. 37) for Nonresidents. These subjects, referred to as "a through g," are the same for the nonresident as for the resident.

High school Advanced Placement courses and UC-transferable college courses are considered honors courses for admission purposes for non-California resident applicants. **Please note**: College entrance exams are also required of non-California residents.

Additional Preparation for University Work: Freshman Applicants

High school courses required for admission to the university are listed at the beginning of this section. This list is not intended to constitute an outline for a valid high school program. The courses listed were chosen for their value as predictors of success in the university. These required courses add up to fifteen "Carnegie" units, while graduation from high school requires from fifteen to nineteen. Courses beyond our requirements should be chosen to broaden your experience in such fields as social sciences and the fine arts, and should fit in with your personal plans for the future.

For example, besides taking courses in chemistry, physics and biology, a science major will find more than three years of mathematics essential. A science major without a working knowledge of trigonometry and at least intermediate algebra is likely to be delayed in getting a degree. If you have an interest in languages or plan a college program with a language other than English requirement, you should have completed more than the two years of language other than English needed for admission.

It is important to understand that the "a through g" requirements for admission are minimum entrance standards. Completing the required high school courses with satisfactory grades will not automatically prepare you for freshman work in every subject, much less in your major or program of study. Many entering students discover that they are not adequately prepared for basic courses, such as English composition and calculus, which they are expected to take in their freshman year. Also, many undergraduate majors, particularly those in sciences and mathematics, require more high school preparation than that necessary for admission. This lack of preparation can cause delays for students who do not choose a major until after they enter the university, or for those who prepare for one major but later decide to change to another.

For these reasons, you are advised to take courses that will prepare you beyond minimum levels of competence in reading, writing, and mathematics. A student who is well prepared for university work will have taken four years of English in high school, four years of mathematics, two to three years of language other than English, three years of laboratory science, two years of history/social science, and one or more years of art or humanities.

Reading: Freshman-level university work demands a great amount, and high level, of reading. Proficiency in reading and understanding technical materials and scholarly works is necessary. Learn to read analytically and critically, actively questioning yourself about the author's intentions, viewpoint, arguments, and conclusions. Become familiar and comfortable with the conventions of standard written English and with various writing strategies and techniques. Your reading experience should include original works in their entirety (not just textbooks and anthologies) that encompass a wide variety of forms and topics.

Writing: Effective critical thinking and proficiency with the written language are closely related, and both are skills which every university student must master. By university standards, a student who is proficient in English composition is able to: (a) understand the assigned topic; (b) select and develop a theme by argument and example; (c) choose words which clearly and precisely convey the intended meaning; (d) construct effective sentences; (e) demonstrate an understanding of the rules of standard written English; and (f) punctuate, capitalize, and spell correctly.

If you plan to attend the university, it is imperative that you take English courses in high school that require the development and practice of these skills. You must take at least four years of English composition and literature that stress expository writing: the development of persuasive critical thinking on the written page.

Mathematics: Many fields require preparation in mathematics beyond that necessary for admission to the university. Courses in calculus are included in all majors in engineering and the physical, mathematical, and life sciences, as well as in programs leading to professional degrees in fields such as medicine, dentistry, optometry, and pharmacy. Moreover, many majors in the social sciences, business, and agriculture require statistics or calculus, and sometimes both.

Most students take calculus or statistics, if required, during the freshman year. The university strongly recommends that students take four years of mathematics in high school, including pre-calculus in the senior year. Courses in mathematics should include basic operations with numerical and algebraic functions; operations with exponents and radicals; linear equations and inequalities; polynomials and polynomial equations; functions and their graphs; trigonometry, logarithms, and exponential functions, and applications and word problems.

Students who are not prepared to take calculus or statistics during the freshman year will have to take one or more preparatory mathematics classes at the university. This could affect their success in other courses and delay their entire undergraduate program.

Laboratory Science: The university requires two years of laboratory science in high school, but many majors require additional science courses. Programs in the biological sciences and some natural resource fields require high school biology, chemistry, and physics. Programs in the physical sciences, mathematics, engineering, agriculture, and the health sciences require chemistry and physics, and recommend biology.

College Credit: Freshman Applicants

There are many steps you can take to earn credit which will be applicable to your graduation from college. Some of these steps may be taken even before you graduate from high school. Among them are the following:

College Courses

Many high schools have arrangements with nearby postsecondary institutions, allowing you to take regular courses while you are still in high school. Many of these courses are accepted by the university exactly as they would be if you were a full-time college student if courses are posted for credit on the college transcript.

No matter how many college units you earn before graduating from high school, you will still apply as a freshman.

College Board Advanced Placement

The university grants credit for all College Board Advanced Placement Tests on which a student scores 3 or higher. The credit may be subject credit, graduation credit, or credit toward general-education or breadth requirements. Students who enter the university with AP credit do not have to declare a major earlier than other students, nor are they required to graduate earlier.

Students are encouraged to take AP tests when appropriate. Counselors should advise a student who is fluent in a language other than English to gain AP credit. AP test scores will not adversely affect a student's chances for admission.

The university grants credit for Advanced Placement tests as described in the AP chart in this catalog. Credit is expressed in quarter-units.

The chart also details requirements met by AP tests by college. Even if subject credit or credit toward specific requirements is not mentioned in the college lists, students receive university credit as described in the chart for all AP tests on which they score 3 or higher. If a student is exempt from a particular course at UCSD, duplication of this course does not earn academic credit.

Admission as a Transfer Applicant

UCSD welcomes transfer students. The campus' Transfer Student Services provides admissions counseling and a variety of programs and services for prospective transfer students. The university defines a transfer applicant as a high school graduate who has been a registered student in another accredited college or university or in college-level extension classes other than a summer session immediately following high school graduation. A transfer applicant may not disregard his or her college record and apply for admission as a new freshman.

Each year UCSD receives more applications from eligible transfer students than the campus can accommodate. In addition to satisfying UC minimum requirements, only transfer students who have completed ninety or more transferable quarter-units by the end of spring term are considered for admission. Priority is given to students transferring from California community colleges. See "Advanced-Standing Selection."

UCSD admits transfer applicants at the junior level only. To be competitive, applicants need to present an academic profile stronger than that represented by the minimum UC admissions requirements, and they should complete preparation for their intended field of study.

IMPACTED MAJORS

It sometimes becomes necessary to limit enrollment in certain majors. When this occurs the affected majors will be listed in the *General Catalog* as soon as possible. When the catalog does not reflect these conditions, newly admitted students will be notified of them in the university's admissions letter. Currently, the following majors *are considered impacted for transfer applicants:* bioengineering and bioengineering: biotechnology; computer science, and computer engineering (within the computer science and engineering department); computer engineering and electrical engineering (within the electrical and computer engineering department). Transfer students interested in applying to any of the above majors must select an alternate major on the UC application. Qualified applicants not admitted directly to the major will be admitted to their alternate major, provided it is not impacted.

PRE-MAJORS

The following majors admit transfer students to pre-major status only: bioengineering: premedical, engineering physics, human development, ICAM-music, ICAM-visual arts, literature/writing, math-computer science, visual arts-media (computing emphasis).

As a pre-major, you must satisfy all prerequisites before admission to the major. The set of conditions, determined on a department-by-department basis, and approved by the San Diego Committee on Educational Policy, is explained in detail under the department listing in this catalog.

Other departments may be approved to offer pre-majors by the Committee in Educational Policy subsequent to this publication. Please refer to "Major Fields of Study" in the introduction to the catalog.

Transfer Eligibility

CALIFORNIA RESIDENTS (MINIMUM UC REQUIREMENTS)

As a transfer applicant you must meet one of the requirements described below to be considered for admission to the university. Admission to UCSD is very competitive. You must exceed the minimum UC admission requirements. See page 42, Advanced Standing Selection.

1. If you were eligible for admission to UC when you graduated from high school—meaning you satisfied the subject, scholarship, and examination requirements—you are eligible to transfer if you have a C (2.0) average in your transferable course work.
2. If you met the scholarship requirements but did not satisfy the subject requirement, you must take transferable college courses in the missing subjects, earning a C or better in each required course, and have an overall C average in all transferable course work to be eligible to transfer.
3. If you met the scholarship requirement but not the examination requirement, you must complete a minimum of twelve semester (eighteen quarter) units of transferable work and earn an overall C (2.0) average in all transferable college course work completed.
4. If you were not eligible for admission to UC when you graduated from high school because you did not meet the scholarship requirements, you must have:
   a. Completed ninety quarter-units (sixty semester-units) of UC *transferable* college credit with a grade point average of at least 2.4, *and;*
   b. Completed a course pattern requirement, earning a grade of C or better in each course, to include:
      - two UC transferable college courses (three semester- or four to five quarter-units each) in English composition, *and;*

- one UC transferable college course (three semester- or four to five quarter-units each) in mathematical concepts and quantitative reasoning, *and;*
- four UC transferable college courses (three semester- or four to five quarter-units each) chosen from at least two of the following subject areas: the arts and humanities, the social and behavioral sciences, the physical and biological sciences.

Students who satisfy the Intersegmental General-Education Transfer Curriculum (see page 51) prior to transferring to UC may satisfy Option 4b above of the transfer admission requirements.

Transfer Eligibility

NON-CALIFORNIA RESIDENTS (MINIMUM UC REQUIREMENTS)

The minimum admission requirements for nonresident transfer applicants are the same as those for residents, except that nonresidents must have a grade-point average of 2.8 or higher in all UC transferable college course work.

Transfer Eligibility

SECOND BACCALAUREATE/LIMITED STATUS APPLICANTS

For the past several years, UCSD has not accepted applications from students who have earned a four-year degree. Please check with the Office of Admissions and Relations with Schools for information on whether applications for second baccalaureate or limited status are being accepted.

If there is a policy change, applications received by the admissions office from nondegree seeking students, or those who have earned a four-year degree, will be reviewed by the college provost's office. Limited status (nondegree-seeking) applicants and those seeking a second B.A. or B.S. will be held to the same restrictions as are other newly admitted students; fields that have restrictions for admission (such as engineering) will also be restricted to these applicants. Students will be screened according to the amount of space available in the college. Admissions will be on an individual basis, and there is no guarantee of admission to the undergraduate college or to a particular major. Applicants seeking a second B.A. or B.S. degree will be given consideration on a space-available basis with a lower priority than all other admitted students. Applicants for a second B.A. or B.S. will have **limited status** until such time as they have met the prerequisites to the major, filed a program approved by the major department and had their proposed program reviewed and approved or disapproved by the college. Limited status students are not awarded on-campus housing.

Limited status students will be eligible to apply for a Guaranteed Student Loan if they have not exceeded the duration limit of eighteen quarters of postsecondary attendance. Academic transcripts will be required from all institutions attended prior to the Financial Aid Office's certifying of the application.

Determining Your Grade-Point Average

Your grade-point average for admission purposes is determined by dividing the total number of acceptable units you have attempted into the number of grade points you earned on those units. You may repeat courses that you completed with a grade lower than C (2.0).

The scholarship standard is expressed by a system of grade points and grade-point averages earned in courses accepted by the university for advanced-standing credit. Grade points are assigned as follows: for each unit of A, four points; B, three points; C, two points; D, one point; and F, no points.

Credit from Another College

The university gives unit credit to transfer students for courses they have taken at other accredited colleges and universities, including some extension courses. To be accepted for credit, the courses must be consistent with those offered at the university, as determined by the Office of Admissions and Relations with Schools. Applications from students who have more than 135 quarter-units (ninety semester-units) of transfer credit and meet selection criteria are considered to have excess units (senior standing). Applicants in this category may be reviewed for admission if space permits.

Many students who plan to earn a degree at the university find it to their advantage to complete their freshman and sophomore years at a California community college. Each community college offers a full program of courses approved for transfer credit. The university will award *graduation credit* for up to seventy semester- (105 quarter-) units of transferable course work from a community college. Courses in excess of seventy semester-units will receive *subject credit* and may be used to satisfy university subject requirements.

The transferability of units from California community colleges and all other postsecondary institutions is as follows: (1) the UC Office of the President determines unit transfer policies which are binding upon, and implemented by, each campus' admissions office; (2) applicability of transferred units to breadth (general-education) requirements is determined for each UCSD college by its provost (see also "Transfer Agreements" below); (3) applicability of units toward the major is determined by the appropriate UCSD academic department. Before applying to UCSD you may obtain more information on many of these matters from the Office of Admissions and Relations with Schools.

Applicants who have completed courses at a postsecondary institution outside the U.S. should have these records sent to the Office of Admissions and Relations with Schools as soon as possible. Advanced standing credit for appropriate courses will be decided on an individual basis.

Note: The University of California does not give credit for CLEP examinations.

University of California/UCSD Transfer Agreements and Preparation Programs

UCSD **strongly recommends** that transfer students complete lower-division breadth and general-education (B/GE) requirements prior to transfer. Transfer students are also strongly advised to complete all lower-division preparation for the major prior to enrollment.

The University of California, San Diego has established five transfer agreements and preparation programs. These agreements and programs, Transfer Admission Guarantee (TAG), UniversityLink, UC Transfer Reciprocity, Intersegmental General-Education Transfer Curriculum Agreement, and Articulation, allow students to fulfill all or most lower-division B/GE requirements prior to transfer.

Transfer students may fulfill their lower-division B/GE requirements with any of these agreements or programs, or they may fulfill them

at UCSD. Completion of IGETC or UC Reciprocity agreements will satisfy the lower-division requirements of Earl Warren, Thurgood Marshall, Sixth, or John Muir College only. Students who follow IGETC or UC Reciprocity are welcome to apply to Eleanor Roosevelt or Revelle College. Courses completed prior to transfer will be applied toward the college's own lower-division requirements. Revelle students must also complete the remainder of the college's requirements. Students at Eleanor Roosevelt College must complete three academic quarters of the "Making of the Modern World" sequence in addition to the IGETC or UC Reciprocity requirements. They must also complete any of the college's general education requirements which can be met by transfer coursework. The college will make every effort to apply as much transfer coursework as possible. Transfer applicants should refer to the catalog pages for individual departments' specific courses for GPA requirements.

Transfer Admission Guarantee (TAG)

UCSD has established a Transfer Admission Guarantee (TAG) program with twenty-five California community colleges. Completing the provisions of the TAG contract will guarantee admission to the term and UCSD college of choice, but not the major. Prospective students completing the provisions of the TAG contract will be guaranteed admission to UCSD and to the college of choice, but not necessarily to an impacted major. Please refer to the catalog pages of individual departments for any specific courses or GPA requirements that may exist for transfer students hoping to be admitted to an impacted major. A list of impacted majors is on page 40 of the catalog. TAG also allows students to fulfill all or most lower-division B/GE requirements prior to transfer. TAG contracts must be signed and submitted by deadlines for specific terms. TAG community college counselors can give you information regarding this program.

Participating TAG colleges are: American River, City College of San Francisco, College of San Mateo, Cosumnes, Cuyamaca, DeAnza, Diablo Valley, El Camino, Foothill, Grossmont, Imperial Valley, Los Angeles Pierce, Mira Costa, Palomar, Pasadena City, Sacramento City, Saddleback, San Diego City, San Diego Mesa, San Diego Miramar, Santa Barbara City, Santa Monica, Sierra, Southwestern, and West Valley.

UniversityLink

UniversityLink provides guaranteed admission to high school seniors who sign an agreement and successfully complete academic and program requirements at a participating community college. UniversityLink partnerships are currently established with the following colleges: Cuyamaca, East Los Angeles, Grossmont, Imperial Valley, Mira Costa, Palomar, San Diego City, San Diego Mesa, San Diego Miramar, and Southwestern.

Transfer Preparation Programs

The following avenues do not guarantee admission. However, they do allow you to fulfill your lower-division general-education requirements at the community college or other UC campus:

UC Transfer Reciprocity Agreement

Transfers who have attended any campus of the University of California and satisfied lower-division breadth and general-education (B/GE) requirements at that campus prior to transfer may consider these requirements satisfied for John Muir, Thurgood Marshall, Sixth, or Earl Warren college only. Students who follow UC Reciprocity are welcome to apply to Eleanor Roosevelt or Revelle college. Courses completed prior to transfer will be applied toward the college's own lower-division requirements. Revelle students must also complete the remainder of the college's requirements. Students at Eleanor Roosevelt College must complete three academic quarters of the "Making of the Modern World" sequence in addition to the UC Reciprocity requirements. They must also complete any of the college's general education requirements which can be met by transfer coursework. The college will make every effort to apply as much transfer coursework as possible.

Transfers in this category should obtain a "certificate of completion of GE requirements" from the campus at which these requirements were satisfied. This can be in the form of a letter or memo addressed to your UCSD undergraduate college academic advising office.

Intersegmental General-Education Transfer Curriculum Agreement

Transfers from California community colleges can fulfill the UC lower-division breadth and general-education (B/GE) requirements by completing the Intersegmental General-Education Transfer Curriculum (IGETC). Completion of IGETC will satisfy the lower-division B/GE requirements at UCSD for Earl Warren, Thurgood Marshall, Sixth, or John Muir college only. Students who follow IGETC are welcome to apply to Eleanor Roosevelt or Revelle college. Courses completed prior to transfer will be applied toward the college's own lower-division requirements. Revelle students must also complete the remainder of the college's requirements. Students at Eleanor Roosevelt College must complete three academic quarters of the "Making of the Modern World" sequence in addition to the IGETC requirements. They must also complete any of the college's general education requirements which can be met by transfer coursework. The college will make every effort to apply as much transfer coursework as possible.

Articulation

UCSD has Articulation Agreements for general education breadth requirements with forty-four California community colleges, and major preparatory agreements for certain majors with a number of California community colleges. These agreements can be found on the ASSIST Web site (http://www.assist.org), which includes statewide transfer information.

International Applicants

International applicants must meet highly rigorous selection criteria for admission.

Courses at UCSD are conducted in English, and every student must have sufficient command of that language to benefit from instruction. To demonstrate such command, students whose native language is not English will be expected to take the Test of English as a Foreign Language (TOEFL). Arrangements for taking this test may be made by writing to the Educational Testing Service, TOEFL Registration Office, P.O. Box 6151, Princeton, New Jersey 08541-6151, U.S.A. Online information is available at http://www.toefl.org. The minimum acceptable TOEFL score is 220 (computer-based exam) or 550 (paper-based exam).

In lieu of the TOEFL, a score of 7 (academic module) on the International English Language Testing System (IELTS) will also be accepted. Information is available at http://www.ielts.org.

The results of this test will be used to determine whether the applicant's command of English

is sufficient to enable him or her to pursue studies effectively at UCSD. International students whose command of English is slightly deficient will be required to take an English course and, therefore, a reduced academic program.

In addition to an adequate English-language background, international students must have sufficient funds available to cover all fees; living, and other expenses; and transportation connected with their stay in the United States (see "Fees and Expenses").

International students are required to obtain health insurance for themselves and dependents who accompany them. Suitable insurance policies and additional information are available at the Student Health Service and at the International Center.

Address all communications concerning undergraduate admission of international students to the University of California, San Diego, Office of Admissions and Relations with Schools, Student Affairs, 9500 Gilman Drive, Dept. 0021, University of California, San Diego, La Jolla, California 92093-0021, email: admissionsinfo@ucsd.edu.

How to Apply for Admission

Undergraduate admissions applications are available online in the fall at the UC Pathways Web site (http://www.universityofcalifornia.edu/admissions.undergradapp/). Copies will also be available at California high schools and community colleges, as well as at all UC campuses. Follow the accompanying directions carefully. If you choose to mail your application, please send it to:

University of California,
Undergraduate Application Processing Center
P.O. Box 4010
Concord, CA 94524-4010

A preaddressed envelope is provided with the paper application.

You may apply to as many as eight campuses of the University of California on one application form.

Application Fees

The basic application fee of $40 entitles you to be considered at one campus of the university. For each additional campus you select, you must pay an extra $40 fee. These fees are not refundable.

When to Apply for Admission

To make sure that you will be considered for admission to the university campus(es) you want to attend, and to the major or program of study you want to pursue, you must submit your completed application during the Priority Filing Period (see below).

If you plan to apply for financial aid, university housing, or other special programs where early application is important, you must also file during this time.

Priority Filing Period

Fall Quarter 2004:
File November 1–30, 2003

Winter Quarter 2005:
File July 1–31, 2004

Spring Quarter 2005:
File October 1–31, 2004

Note: UCSD accepts winter and spring applications from Transfer Admission Guarantee (TAG) students only.

Adding a Campus

If you decide to apply to additional UC campuses after you submit your application, submit your request *in writing* to the processing service before the filing deadline. Be sure to note your application ID number, additional campus(es) to which you wish to apply, major(s), major code(s), and a check or money order for $40 for each additional campus you select, payable in U.S. dollars to the "Regents of the University of California." You may not substitute new campus choices for your original choices. Your request will be honored only if the campus(es) you choose still has space available. The processing service will notify you as to whether your application was accepted. Do not submit a second application form; it will not be processed.

Selecting Campuses and Programs of Study

You are encouraged to approach the selection of a university campus and a program of study very carefully. You may be familiar with only one or two of the university's general campuses, probably those nearest to your home or mentioned more frequently in the news. You should seriously consider the many different educational alternatives and programs offered by other campuses of the university before completing your application. Your counselor and the university staff in the Office of Admissions and Relations with Schools can provide you with insights that will help you in the selection process.

College Choice

The application to UCSD must include a choice of undergraduate college (Eleanor Roosevelt, Thurgood Marshall, Earl Warren, Revelle, John Muir, or Sixth) before it can be processed. Selecting alternative UCSD college choices is also advisable since each college has enrollment quotas that limit the number of new freshmen and transfer students. The Office of Admissions and Relations with Schools will select an alternate college if an alternate choice is not indicated.

Transcripts

If you are admitted for the fall term, you must arrange to have final, official transcripts sent to the Admissions Office no later than July 15. If you attended school outside the United States, see the information in the box below.

Freshman Applicants: If you are admitted you must arrange to have an official, final high school transcript (showing your date of graduation) sent to the campus where you plan to enroll. *Unless a campus requests it, do not send a sixth or seventh semester transcript.*

Transfer Applicants: If you are admitted, you will be asked to submit official transcripts from all schools and colleges you have attended, *including high school*, regardless of your length of attendance or whether you believe the credit is transferable. Some campuses may request transcripts prior to admission.

Transcript Information for Applicants Who Have Attended School Outside the United States

The Admissions Office may make a preliminary evaluation of your application based on the information you provide on your application. However, if you are admitted, the university must receive an official academic record directly from each institution you attended, beginning with grade nine, and up to, and including, the school or college/university you currently attend.

Each academic record must list the dates you attended the institution, the titles of courses and

Advanced Placement Credit:

EXAM AND UNITS FOR UNIVERSITY CREDIT	UCSD COURSE EXEMPTIONS (OR USE ON MAJOR)	REVELLE COLLEGE	MUIR COLLEGE
Art (Studio) • Drawing Portfolio. . . . . 8 • 2D Portfolio. . . . . 8 • 3D Portfolio. . . . . 8 *(8-unit maximum for all tests)*	None	Fulfills fine arts requirement and 1 course of the noncontiguous area of focus or may be used as 8 units of elective credit.	8 units of elective credit.
Art–History. 8	None	Fulfills fine arts requirement or 2 courses of the noncontiguous area of focus or may be used as 8 units of elective credit.	8 units of elective credit.
Biology. 8	Score of 4 or 5 = BILD 1 and 2 Score of 3 = Biol. 10; may take Biol. 1, 2, 3 for credit.	Score of 3, 4, or 5 meets Revelle biology requirement.	Score of 3 exempts BILD 10. Score of 4 exempts BILD 1 and 2.
Chemistry. 8	Score of 3 = exempt Chem. 4 or 11. Score of 4 = exempt Chem. 4, 11 or 6A; may take Chem. 6AH,6BH,6CH for credit Score of 5 = exempt. Chem. 6A-B-C or Chem. 11; may take Chem. 6BH,6CH for credit	Partial completion of natural science requirement.	Score of 3 exempts Chem. II. Score of 4 exempts Chem II or 6A. (May take 6AH, 6BH, and 6CH for credit.) Score of 5 exempts Chem. II or 6A-B-C. (May take 6BH and 6CH for credit.)
Computer Science • Computer Science A. . . . . 2 • Computer Science AB. . . . . 4 *(4-unit maximum for both tests)*	Students must see faculty adviser.	1 course of a noncontiguous area of focus. Score of 3 or 4 on A or AB exam = elective units.	2-4 units elective credit.
Economics • Microeconomics. . . . . 4 • Macroeconomics. 4	Score of 5 AP Micro = Econ. 1A/2A. Score of 5 AP Macro = Econ. 1B/2B. Score of 3, or 4 = elective units.	Each score of 3, 4, or 5 exempts student 1 course on social science requirement.	Score of 3, 4 clears 4 units of elective credit. Score of 5 exempts Econ. 1. Score of 3, 4 clears 4 units of elective credit. Score of 5 exempts Econ. 3.
English • Composition and Literature. . . . . 8 • Language and Composition. . . . . 8 *(8-unit maximum for both tests)*	Score of 3, 4, or 5 meets Subject A requirement.	2 courses of the noncontiguous area of focus or 8 units of elective credit.	8 units of elective credit and clears Subject A. (8 units maximum for both tests)
Environmental Science. 4	Score of 4 or 5 = exempt Earth Science 10	Score of 3, 4, or 5 can be used for one course of noncontiguous area of focus.	Earth Science 10.
Geography, Human 4	None	4 units of elective credit.	4 units of elective credit.
Government and Politics • United States. 4	Score of 3, 4, or 5 satifies American History and Institutions. Score of 5 = exempt Poli. Sci. 10.	1 course toward social science requirement or 1 course of noncontiguous area of focus.	Score of 5 exempts Poli. Sci. 10.
Government and Politics • Comparative. 4	Score of 5 = exempt Poli. Sci. 11.	1 course toward social science requirement or 1 course of noncontiguous area of focus.	Score of 5 exempts Poli. Sci. 11.
History • United States. 8	Score of 3, 4, or 5 = exempt 2 quarters U.S. History: May take HILD 2A, 2B or 2C to complete sequence. Satisfies American History and Institutions.	2 courses toward social science requirement or 2 courses of noncontiguous area of focus.	Score of 3, 4, 5 exempts 2 courses in HILD 2A-B-C sequence.
History • European. 8	None	2 courses of the noncontiguous area of focus.	Score of 3, 4, 5 exempts 2 European history courses by petition.
History • World 8	None	2 courses of the noncontiguous area of focus.	Score of 3, 4, 5 exempts 2 non-Western history courses by petition.
Language • French. . . . . 8 • German. . . . . 8 • Spanish. 8	Score of 3 = exempt Ling. 1C/1CX. Score of 4 = exempt Ling. 1D/1DX or Lit. 2A. Score of 5 = exempt Lit. 2B.	Score of 4 or 5 meets proficiency requirement.	Score of 3 exempts LING 1B/BX and 1C/CX. Score of 4 exempts LING 1D/DX and Lit. 2A. Score of 5 exempts Lit. 2A-B. Determines placement in language sequence if student chooses that option. Same as use on major.
Latin • Latin: Virgil. . . . . 4 • Latin: Literature. 4	Score of 3, 4, or 5 = exempt Latin 1, 2, 3.	Usually prepares student to pass proficiency exam; 2 courses of the noncontiguous area of focus or may be used as 8 units of elective credit.	Latin 1, 2, 3.
Literature • French. . . . . 8 • Spanish. 8	Score of 3 = exempt Ling. 1D/1DX or Lit. 2A. Score of 4 = exempt Lit. 2B. Score of 5 = exempt Span. Lit. 2C or French Lit. 50.	Score of 3, 4, or 5 meets proficiency requirement.	Score of 3 exempts LING 10/10X and Lit. 2A. Score of 4 exempts Lit. 2A-B. Score of 5 exempts Spanish: Lit 2B-C/French/French: Lit. 2B and 50. Determines placement in language sequence if student chooses that option. Same as use on major.
Mathematics • Calculus AB. . . . . 4 • Calculus BC. . . . . 8 *(8-unit maximum for both tests)*	Score of 4 or 5 AB exam = exempt Math. 20A or 10A. Score of 3 on AB exam = exempt Math. 20A or 10A; may take 20A for credit. Score of 4 or 5 on BC exam = exempt Math. 20A, 20B or 10A, 10B. *Score of 3 on BC exam = exempt Math. 20A and may take Math. 20B for credit;* or = exempt Math. 10A, 10B.	AB exam = 1 course toward math requirement; BC exam = 2 courses toward math requirement.	Score of 3 exempts Math. 20A or 10A. May take 20A for credit. Score of 4, 5 exempts Math. 10A or 20A. Score of 3 exempts Math. 20A and may take Math. 20B for credit or exempt Math. 10A-B. Score of 4, 5 exempts Math. 20A-B or 10A-B. AB exam meets 1 course of math. option. BC exam meets two courses of math. option. Same as use on major. (8 unit maximum on both tests)
Music • Theory. 8	None	Fulfills fine arts requirement and 1 course of noncontiguous area of focus.	8 units elective credit only.
Physics • Physics B. . . . . 8 • Physics C Mechanics. . . . . 4 • Physics C Electricity and Magnetism. . . . . 4 *(8-unit maximum for all three tests)*	B exam = elective credit and exempt Phys. 10. C exam (Mech.) score of 3 or 4 = exempt Phys. 1A and may take Phys. 2A or 4A for credit. C exam (Mech.) score of 5 = exempt Phys.2A, 4A. C exam (E&M) score of 3 or 4 = exempt Phys. 1B and may take Phys. 2B or 4B for credit. C exam (E&M) score of 5 = exempt Phys. 2B or 4C and may take Phys. 4B for credit.	B exam = elective credit C exam = (Mech. or E&M) each 4 units can meet 1 course of the natural science requirement.	Score of 3, 4, 5 8 units of elective credit and exempts Phys. 10. Score of 3, 4 exempts Phys. 1A may take Phys. 2A or 4A for credit. Score of 5 exempts Phys. 2A or 4A. Score of 3, 4 exempts Phys. 1B may take Phys. 2B or 4B for credit. Score of 5 exempts Phys. 2A or 4A. Score of 3, 4 exempts Phys. 1B may take Phys. 2B or 4B for credit. Score of 5 exempts Phys. 2B or 4C and may take Phys. 4B for credit. Same as use on major.
Psychology. 4	Score of 4 or 5 = exempt Psych. 1.	1 course toward social science requirement or 1 course of noncontiguous area of focus.	4 units elective credit only.
Statistics. 4	None	4 units of elective credit.	4 units of elective credit.

The University of California grants credit for all College Board Advanced Placement Tests on which a student scores 3 or higher. The credit may be subject credit for use on a minor or prerequisites to a major, or credit toward general-education requirements or elective units toward graduation.

The number of units granted for AP tests are not counted toward the maximum number of credits required for formal declaration of an undergraduate major or the maximum number of units a student may accumulate prior to graduation. Students who enter the university with AP credit do not have to declare a major earlier than other students, nor are they required to graduate earlier.

Application to College and Major Requirements

THURGOOD MARSHALL COLLEGE	WARREN COLLEGE	ELEANOR ROOSEVELT COLLEGE	SIXTH COLLEGE
8 units of elective credit.	2 courses toward Visual Arts or Humanities PofC or Area Study.	1 course toward Group B fine arts requirement. 2D or 3D toward fulfillment of 1 of the 2 GE courses in Fine Art.	1 course toward Art Making.
May apply 1 course toward fine arts	2 courses toward Visual Arts or Humanities PofC or Area Study.	1 course toward Group B fine arts requirement.	1 course toward Narrative, Aesthetic and Historical Reasoning.
1 course of natural science requirement. May also apply 1 course toward disciplinary breadth if non-contiguous to major.	2 courses toward Science and Technology or Fundamentals of Bio PofC. Score of 4 or 5 meets 2 courses toward Biology or Sci & Tec PofC or Fundamentals of Biology PofC. May not take Bio 1 or 2 or BILD 10.	Score of 3, 4, or 5 meets two courses of natural science requirement.	Score of 3, 4, or 5: meets 1 course toward Analytical Methodologies/Scientific Method.
May apply 1 course of natural science requirement and may apply 1 course toward disciplinary breadth if noncontiguous to major.	Score of 3 meets 2 courses toward Science and Technology PofC. Score of 4 meets 2 courses toward Science & Technology PofC; 1 course may apply toward Chemistry PofC (for Chemistry A). Score of 5 exempts Chemistry 6ABC, 6BH; only 2 courses may count toward Science and Technology PofC.	Meets 2 courses toward natural science requirement.	Score of 3, 4, or 5: meets 1 course toward Analytical Methodologies/Scientific Method.
AB exam = 1 course toward mathematics/computer/ statistics requirement.	A exam: 2 units of elective credit; score of 4 on AB exam: 4 units of elective credit; score of 5 on AB exam meets *1 course toward Formal Skills requirement or Science and Technology PofC.*	A exam = 2 units elective credit AB exam = 1 of 2 courses quantitative/ *formal skills requirement.*	1 course toward Computing Requirements.
May apply 1 course toward disciplinary breadth if noncontiguous to major.	Each score of 3 or 4 meets 1 course toward an Economics or Perspectives in Social Science PofC.	4-8 units of elective credit.	Score of 4, or 5: 1 course toward Social Analysis. Score of 3: elective credit.
8 units of elective credit.	Score of 3, 4 or 5 satisfies Subject A requirement.	8 units of elective credit.	Either test: satisfies Subject A requirement; 8 units elective credit.
4 units of elective credit.	I course toward Science and Technology PofC.	Meets 1 course toward natural science requirement.	1 course toward Analytical Methodologies/ Scientific Method.
4 units of elective credit.	4 units of elective credit.	4 units of elective credit.	4 units of elective credit.
May apply 1 course toward disciplinary breadth if noncontiguous to major.	1 course toward Perspectives in Social Science PofC or Political Science PofC or Political Science Area Study (also satisfies American History and Institutions requirement).	4 units of elective credit.	Score of 4 or 5 fulfills Social Analysis requirement. Score of 3: elective credit. Political Science majors: Score of 5 required to meet major requirement.
May apply 1 course toward disciplinary breadth if noncontiguous to major.	1 course toward Perspectives in Social Science PofC or Political Science PofC or Political Science Area Study.	4 units of elective credit.	Score of 4 or 5 fulfills Social Analysis requirement. Score of 3: elective credit. Political Science majors: Score of 5 required to meet major requirement.
May apply 2 courses toward disciplinary breadth if noncontiguous to major.	2 courses toward History or Humanities PofC or Area Studies; may take HILD 2A, 2B, or 2C to complete sequence(s).	8 units of elective credit.	1 course toward Narrative, Aesthetic and Historical Reasoning.
May apply 2 courses toward disciplinary breadth if noncontiguous to major.	2 courses toward History or Humanities PofC or Area Study.	1 course may apply toward regional specialization. See ERC academic counselor for details	1 course toward Narrative, Aesthetic and Historical Reasoning.
May apply 2 courses toward disciplinary breadth if noncontiguous to major.	2 courses toward History or Humanities PofC or Area Study.	8 units of elective credit.	1 course toward Narrative, Aesthetic and Historical Reasoning.
May apply 2 courses toward disciplinary breadth if noncontiguous to major.	Score of 3 meets 2 courses toward a Foreign Language and Culture PofC or Area Study; score of 4 meets 2 courses toward a Foreign Language and Culture PofC or Area Study or 1 course toward a Humanities, Literature PofC and Area Study; score of 5 meets 2 courses toward a Foreign Language and Culture, Literature, or Humanities PofC or Area Study.	Score of 3=8 units of elective credit Score of 4 or 5 meets language proficiency requirement.	1 course toward Narrative, Aesthetic and Historical Reasoning.
May apply 1–2 courses toward disciplinary breadth if noncontiguous to major.	Score of 3, 4 or 5 either test meets 1 course toward Classical Studies PofC; or Humanities PofC or Area Study.	1 course of language usually prepares student to pass proficiency exam.	1 course toward Narrative, Aesthetic and Historical Reasoning.
May apply 2 courses toward disciplinary breadth if noncontiguous to major.	Score of 3 meets 2 courses toward a Foreign Language and Culture or 1 course toward Literature, Humanities PofC or Area Study; score of 4 meets 2 courses toward a Foreign Language and Culture or 2 courses toward Literature, Humanities PofC or Area Study; score of 5 meets 2 courses toward a Foreign Language and Culture, Literature, or Humanities PofC or Area Study.	Meets language proficiency requirement.	1 course toward Narrative, Aesthetic and Historical Reasoning.
If AB exam may apply 1 course toward math and statistical requirement. If BC exam may apply 2 courses toward math and statistical requirement.	AB exam meets 1 course of formal skill requirement; BC exam completes 2 courses formal skills requirement.	AB exam =.1 course toward quantitative/ formal skills requirement. BC exam completes quantitative *formal skills requirement.*	AB or BC exam: 1 course toward Structured Reasoning.
1 course toward fine arts requirement and 1 course toward the disciplinary breadth requirement if non-contiguous to major.	Completes Formal Skills requirement.	1 course toward Group B fine arts requirement	1 course toward Art Making.
B exam = 1 course of natural science requirement and 1 course toward disciplinary breadth if noncontiguous to major. 4 units of C exam = 1 course of nat. sci. requirement. 8 units of C exam = 1 course of natural science requirement and 1 course toward disciplinary breadth if noncontiguous to major.	B exam: score of 3, 4 or 5 meets 2 courses toward Science and Technology PofC; either C exam meets 1 course toward Science and Technology PofC.	B exam = 2 courses for natural science; C exam (E&M) = 1 course for natural science; C exam (Mech.) = 1 course for natural science for a total of 2 courses maximum.	Physics B: elective credit. Physics C: 1 course toward Analytical Methodologies/Scientific Method.
May apply as 1 course toward disciplinary breadth requirements if noncontiguous to major.	1 course toward Psychology or Perspectives in Social Science PofC or Area Study.	4 units of elective credit.	1 course toward Social Analysis.
4 units of elective credit.	1 course toward Formal Skills or Perspectives in Social Science, Psychology, or Sciology P of C	1 course toward quantitative/formal skills requirement	May apply toward breadth requirements

A student cannot receive credit for a UCSD course which duplicates AP credit. Where the chart says "exempt" or "equal to a UCSD course number," that course may not be taken for credit. Students who are fluent in a language other than English should not overlook the opportunity to get AP credit by taking the foreign/literature exams.

Note: Please see college academic adviser for clarification of any questions you may have.

examinations you completed, the grades (marks) you received, the credit, hours or units earned, and any degree or diploma you may have received. In the United States, the academic record is called a "transcript." It may be called by another name —such as leaving certificate, maturity certificate, bachillerato, or baccalauréat—in your country.

Because it may take some time for schools outside the U.S. to forward your records to the university, you are encouraged to send a legible photocopy of your official foreign academic records directly to the Admissions Office at each campus to which you apply. (Do not attach to your application for admission.)

The university recognizes that it may be difficult to obtain foreign records in the event of political upheaval or natural disaster; however, these situations are rare. Failure to provide official records may jeopardize your enrollment at the university.

The transcripts and other documents that you submit as part of your application become the property of the university; they cannot be returned to you or forwarded in any form to another college or university.

Checklist for Applicants

1. File an application on the University of California's Pathways Web site (http://www.universityofcalifornia.edu/admissions/undergradapp) during the November filing period. Fee may be paid by credit card, or you may ask the UC application processing services to bill you by mail.
2. You must select UCSD colleges in order of preference. Be sure to sign the form.
3. Complete your personal statement.
4. Fill in the self-reported academic data and test information carefully and accurately.
5. Take the SAT I or ACT test and SAT II: Subject Tests if you are a freshman applicant **no later than December of your senior year.**
6. Request that your school(s) send transcripts and other required documents directly to:

   Office of Admissions and Relations with Schools
   Student Affairs
   UCSD
   9500 Gilman Drive, 0021
   La Jolla, CA 92093-0021

   Final high school transcripts, and all college transcripts for transfer students, must be on file in the UCSD Office of Admissions and Relations with Schools by July 15.

Notification of Admission

Admission–Freshmen

If you are a freshman applicant and you filed during the priority filing period, UCSD will notify you whether you have been admitted beginning mid-March and no later than March 31. All offers of admission are provisional until the receipt and verification of your test results and official final high school transcript (and college transcript, if applicable). If you are offered admission based on your self-reported academic record, official documents will be used to verify the self-reported academic data you submit. Offers of admission will be rescinded if: a) there are discrepancies between your official transcripts and your self-reported academic record; b) you do not complete the courses listed as "in progress" or "planned"; or c) you do not complete your twelfth-grade courses at the same academic level as in previous course work.

Admission–Transfer

If you are applying to transfer, UCSD will send you notification between mid-March and May 1. All offers of admission are provisional until the receipt and verification of all official transcripts. If you are offered admission based on your self-reported academic record, your official high school transcript and transcripts from all colleges attended will be used to verify the self-reported academic data you submit. Offers of admission will be rescinded if: a) there are discrepancies between your official transcript and your self-reported academic record; b) any college or school attended is omitted from your application; c) you do not complete the courses listed as "in progress" or "planned;" or d) the specified GPA is not maintained for courses "in progress" or "planned."

These admission notification dates apply only to applicants who file within the priority periods. Applicants for winter and spring quarters are notified as soon as possible (within three months) following receipt of all appropriate documents.

After receipt of notification of admission:

1. Read the information in your online admission notification carefully, noting any special provision governing your admission.
2. Request that any outstanding transcripts be forwarded to the Office of Admissions and Relations with Schools by the stated deadline.
3. Complete and submit to the Office of Admissions and Relations with Schools the Statement of Intent to Register (SIR), online or by mail, and the Statement of Legal Residence (SLR). Please note the deadline to return your SIR. If it is submitted or is postmarked after this date, you may be denied enrollment due to space limitations. For fall quarter admitted students, the deadline for return of your SIR and SLR is June 1 for transfers.

Statement of Intent to Register (SIR)

Upon receipt of your Statement of Intent to Register (SIR), the Office of Admissions and Relations with Schools provides information to various campus offices including the Financial Aid Office, Housing and Dining Services, and your college provost. You will then receive additional information from each of these offices. The $100 nonrefundable fee (if required) accompanying your SIR is applied toward payment of the university registration fee for the quarter of your admission. International applicants outside the territorial United States are not required to submit the $100 deposit with the Statement of Intent to Register.

Even though you may be admitted to more than one campus of the University of California, you can return SIR to only one campus.

College Orientation and Registration of New Students

Prior to the quarter for which they have been admitted, new students will receive information from their colleges regarding orientation and enrollment in classes. Admitted students (freshmen and transfers) will be required to participate in new-student orientation. Academic advising and enrollment in courses will take place during orientation sessions.

Student Health Requirement

Entering students are required to complete a Medical History form and to send it to the

Student Health Center. Forms and complete instructions are usually sent to entering students well in advance of registration, or they may be obtained at the Student Health Center. Information submitted to the Student Health Service is kept confidential and is carefully reviewed to help provide individualized health care.

Mandatory Health Insurance: The University of California has established mandatory health insurance as a non-academic condition of enrollment for undergraduates. Health insurance packages will be available for year-round coverage. The cost will be factored into grants, loans, and work-study programs offered to students who receive financial assistance. Students already covered by adequate health insurance can waive the requirement. The new campus-based insurance plans will not replace the primary medical care and referral services provided by the Student Health Service.

Hepatitis B Immunization: The California State Legislature mandates that first-time enrollees at the University of California who are eighteen years of age or younger provide proof of full immunity against Hepatitis B prior to their enrollment. All students who accept UCSD's offer of admission, and who will still be eighteen years old by the beginning of the Fall Quarter, will receive the Hepatitis B information in the mail from the campus. The immunization consists of a series of three vaccinations. You can receive further information through your health care provider or county health department.

Students are urged also to submit a physical examination form completed by their family physician, particularly if they plan to take part in intercollegiate athletic competition. Routine physical examinations are not provided by the Student Health Service. An optional student health plan that provides additional benefits off campus may be purchased at the time registration fees are paid. Student health insurance is also mandatory for all international and graduate level students and is a condition of enrollment.

Reapplication

An application for admission is effective only for the quarter for which it is submitted. If you are ineligible for admission, or if you are admitted and do not register, you must file a new application to be considered for a later quarter. The selection criteria in effect for the new term must be met.

If you have been admitted to the university, enrolled, and paid registration fees, but did not attend, contact the Office of the Registrar for readmission information.

Fees and Expenses

The exact cost of attending the University of California, San Diego will vary according to personal tastes and financial resources of the individual. Generally, the total expense for three quarters, or a college year, is estimated at approximately $19,000 for California residents living away from home.

It is possible to live simply and to participate moderately in the life of the student community on a limited budget. The university can assist the student in planning a budget by indicating certain and probable expenses. For information regarding student employment, loans, scholarships, and other forms of financial aid at UCSD, see "Campus Services and Facilities" in this catalog.

INTERSEGMENTAL GENERAL-EDUCATION TRANSFER CURRICULUM (IGETC)

Summary Outline

Completion of the Intersegmental General-Education Transfer Curriculum (IGETC) will permit a student to transfer from a community college to a campus in the University of California system without the need, after transfer, to take additional lower-division, general-education courses.

It should be noted that completion of the IGETC is not a requirement for transfer to UC, nor is it the only way to fulfill the lower-division, general-education requirements of UC prior to transfer. Depending on a student's major and field of interest, the student may find it advantageous to take courses fulfilling the general-education requirements of the UC campus or college to which the student plans to transfer. IGETC is applicable at Earl Warren, Sixth, Thurgood Marshall, and John Muir colleges only. Courses completed prior to transfer will be applied toward the college's own lower-division requirements. Revelle students must also complete the remainder of the college's requirements. Students at Eleanor Roosevelt College must complete three academic quarters of the "Making of the Modern World" sequence in addition to the IGETC requirements. They must also complete the remainder of the college's general education requirements.

English Communication:	One course, English Composition, three semester- (four to five quarter-) units; this course is a prerequisite to Critical Thinking.
	One course, Critical Thinking-English Composition, three semester- (four to five quarter-) units; strong emphasis on writing; prerequisite: English Composition.
Mathematical Concepts and Quantitative Reasoning:	One course, Mathematics/Quantitative Reasoning, three semester- (four to five quarter-) units.
Arts and Humanities:	Three courses, at least one course in arts, and at least one course in humanities, nine semester- (twelve to fifteen quarter-) units.
Social and Behavioral Sciences:	Three courses in at least two disciplines or an interdisciplinary sequence, social and behavioral sciences, nine semester- (twelve to fifteen quarter-) units.
Physical and Biological Sciences:	One course in each area, at least one must include a laboratory; two courses, seven to nine semester- (nine to twelve quarter-) units.
Language Other than English:	Proficiency equivalent to two years' high school study in the same language.

ESTIMATED EXPENSES FOR UNDERGRADUATE RESIDENTS OF CALIFORNIA

Budget Category	Living With Parents	University Housing	Off Campus
Resident Fees	$6,020.50	$6,020.50	$6,020.50
Room and Board	$2,502	$8,998	$8,016
Books and Supplies	$1,407	$1,407	$1,407
Transportation	$1,844	$1,025	$1,799
Personal Expenses	$1,489.50	$1,347.50	$1,555.50
Health Insurance Fee/Allowance	$ 657	$ 657	$ 657
Basic Budget Totals	$13,920	$19,455	$19,455

Non-Resident Tuition for Undergraduates

$16,476 + $528 Education Fee

Note: Fees are subject to change by the Board of Regents

Undergraduate Registration

Enrollment in Courses

Prior to the quarter for which they have been admitted, new students will receive information from their college regarding orientation dates, course enrollment, and fee-payment deadlines. Enrollment materials will be provided at the college provosts' offices on the days assigned for new students' registration. New freshman students admitted for the fall quarter will be invited to attend a new student orientation during the summer preceding fall quarter. Enrollment in courses will take place at that time.

New Student Orientation

Orientation programs are designed to acquaint students with the nature, functions, and purposes of UCSD's college system, and to show students how to deal with a variety of requirements set by the university, college, and academic departments. Although all six colleges have the same goals for students, each has developed its own distinctive program. The professional staffs of Revelle, Muir, Marshall, Warren, Roosevelt, and Sixth Colleges have designed programs for their respective students and the students' parents. During the school year, these same staff members are occupied in counseling continuing students, so they have planned these orientation sessions for the summer, when they can devote 100 percent of their time to becoming acquainted with new students and introducing them to a whole new way of doing things.

Not only will new students be made aware of the opportunities offered by their college and the UCSD community as a whole, they will also receive a great deal of guidance in selecting courses and will register in advance for their first fall quarter classes.

To prepare for the orientation session, students should spend a little time thinking about what they want from their education. If the decision of which major to pursue has not been made, students can benefit by narrowing their choices, eliminating subjects they know they don't want, and selecting areas of possible interest. Students will have a lot of help in making such choices, but anything they can do in advance will make the process easier.

All new students are required to attend an orientation/registration session, and they will be charged a fee for the program. Parents' attendance is optional, but we hope they will want to come. Parents' concerns about life at UCSD are not exactly the same as students', so they will be invited to separate meetings.

In addition to the Summer Orientation, students should attend Welcome Week—the week before the official opening of the fall quarter and the beginning of classes.

Continuing Student Enrollment

Continuing students (those currently registered or eligible to register) should refer to the quarterly *Enrollment Information and University Policies* for enrollment information, dates, and fee payment instructions. The *Enrollment Information and University Policies* is available on StudentLink each quarter.

Definitions

Students are considered *enrolled* when they have requested space in at least one course and space in classes has been reserved. Students are not considered *registered* until they have both enrolled in courses and paid registration fees.

Enrollment is processed using WebReg in StudentLink on the Web. Continuing undergraduate students are assigned a start time, after which they may enroll in classes. Start times are based on the number of units completed. Students who have completed more units will receive earlier start times than students with fewer units.

Students are responsible for all courses in which they are enrolled. Students should check StudentLink/WebReg to confirm class enrollments. Alternately, students may go to the Registrar's Office and obtain a printout of their class schedule. Students must make any necessary changes by the Add/Change/Drop process (through WebReg in StudentLink or in person at the Registrar's Office) or by appropriate withdrawal.

Adding, Changing, and Dropping Courses

After enrollment, students may make any necessary corrections to their class schedules on WebReg in StudentLink, or by submitting an Add/Change/Drop Card in person to the Registrar's Office. Students may add courses through the second week of instruction, or through the fourth week of instruction with department approval. Please refer to the quarterly *Enrollment Information and University Policies* for appropriate approvals required.

Students may continue to change grading options through the end of the fourth week and to drop courses through the end of the ninth week of instruction. Students who wish to drop *all* their courses are required to file an Undergraduate Withdrawal form with their college academic advising or dean's office. Please see the W (Withdrawal) grade regulation that applies after the fourth week of instruction.

Weeks

1–2: ADD/DROP/CHANGE Grade Option
2–4: DROP/CHANGE Grade Option
5–9: DROP ONLY–"W" recorded on transcript
10 and later: No changes; final grade assigned

The Undergraduate Program

The undergraduate program consists of four four-unit courses each quarter, or sixteen units per quarter, for four years. Students must complete a minimum of thirty-six units in three consecutive quarters in order to satisfy the minimum progress requirements (see "Minimum Progress" in the "Academic Regulations" section). Undergraduate students wishing to take more than twenty-two units of credit in a quarter will need their college provost's approval.

Approval for Enrollment for More than 200 Units

The minimum unit requirement for the bachelor's degree is 184 quarter-units in Revelle College and 180 quarter-units in Muir, Marshall, Warren, Roosevelt, and Sixth Colleges. A student is expected to complete the requirements for graduation within this minimum unit requirement. The bachelor of science degree may require satisfaction of additional units, depending upon the student's major. Candidates for B.S. degrees in engineering are permitted 230 units (240 for engineering majors in Revelle and Roosevelt colleges).

Under special circumstances, students may extend their undergraduate training beyond the minimum. Non-engineering students who are attempting to achieve more than 200 quarter-units will not be permitted to register without their college provost's approval. Other exceptions will be granted only for compelling academic reasons and only with the approval of the college provost and the concurrence of the Committee on Educational Policy. Transfer units applicable toward general-education requirements or major requirements are included in the maximum unit calculation; all other transfer units are excluded. Advanced placement and international baccalaureate units are excluded. (See information regarding "Minimum Unit Limitation" in the "Academic Regulations" section of this catalog.)

Enrollment and Registration Holds

A student may have a "hold" placed on his or her enrollment or registration (payment of fees) and/or academic transcripts for the following reasons:

1. Failure to respond to official notices.
2. Failure to settle financial obligations when due or to make satisfactory arrangements with the Student Business Services Office.
3. Failure to present certification of degrees and/or status on leaving previous institution(s).
4. Failure to comply with admission conditions.

Each student who becomes subject to a hold action is given advance notice and ample time to deal with the situation. However, if the student fails to respond, action will be taken without further notice, and he or she is entitled to no further services of the university, except assistance toward reinstatement.

Undergraduate students wishing to have their status restored must secure a release from the office initiating the hold action. Reinstatement is not final until the registration process is completed.

Change of Address

Students who change their local or permanent addresses are expected to notify the registrar's office either in writing or via StudentLink at once. Change-of-address cards are available at the Office of the Registrar, 301 University Center, and StudentLink is available through the campus Web site: InfoPath, at www.ucsd.edu. Students will be held responsible for communications from any university office sent to the last address on record and should not claim indulgence on the plea of not receiving the communication.

California Residence for Tuition Purposes

TUITION FEE FOR NONRESIDENT STUDENTS

If you have not been living in California with intent to make it your permanent home for more than one year immediately before the residence determination date for each term in which you propose to attend the university, you must pay a nonresident tuition fee in addition to all other fees. The residence determination date is the day instruction begins at the last of the University of California campuses to open for the quarter—and for schools on the semester system, the day instruction begins for the semester.

LAW GOVERNING RESIDENCE

The rules regarding residence for tuition purposes at the University of California are governed by the California Education Code and implemented by Standing Orders of the Regents of the University of California. Under these rules, adult citizens and certain classes of aliens can establish residence for tuition purposes. There are particular rules that apply to the residence classification of minors. (See below.)

WHO IS A RESIDENT?

If you are an adult student (at least eighteen years of age) you may establish residence for tuition purposes in California if: (1) you are a U.S. citizen; (2) you are a permanent resident or other immigrant; or (3) you are a nonimmigrant who is not precluded from establishing a domicile in the United States. Nonimmigrants who are not precluded from establishing domicile in the United States include those who hold valid visas of the following types: A, E, G, H-1, H-4, I, K, L, 0-1, 0-3, or R. To establish residence you must be physically present in California for more than one year and you must have come here with the intent to make California your home as opposed to coming to this state to go to school. Physical presence within the state solely for educational purposes does not constitute the establishment of California residence, regardless of the length of your stay. You must demonstrate your intention to make California your home by severing your residential ties with your former state of residence and establishing those ties with California. If these steps are delayed, the one-year durational period will be extended until you have demonstrated both presence and intent for one full year. Effective fall 1993, if your parents are not residents of California or you were not previously enrolled as a UC student, you will be required to be financially independent in order to be a resident for tuition purposes. Your residence cannot be derived from your spouse or your parents.

REQUIREMENTS FOR FINANCIAL INDEPENDENCE

You will be considered "financially independent" if one or more of the following applies: (1) you are at least twenty-four years of age by December 31 of the calendar year for which you are requesting residence classification; (2) you are a veteran of the U.S. Armed Forces; (3) you are a ward of the court or both parents are deceased; (4) you have legal dependents other than a spouse; (5) you are married, or a graduate student or a professional student, and you were not claimed as an income tax deduction by your parents or any other individual for the tax year immediately preceding the term for which you are requesting resident classification; or (6) you are a single undergraduate student and you were not claimed as an income tax deduction by your parents or any other individual for the two tax years immediately preceding the term for which you are requesting resident classification, and you can demonstrate self-sufficiency for those years and the current year; (7) your parents are residents of the State of California; (8) you reach the age of majority in California while your parent(s) were residents of this state AND the California resident parent(s) leave the state to establish a residence elsewhere AND you continue to reside in the State of California with all your ties here after your parent(s) departure. (Note: Financial dependence will not be a factor in residence status for graduate student instructors, graduate student teaching assistants, research assistants, junior specialists, postgraduate researchers, graduate student researchers, and teaching associates who are employed forty-nine percent or more of full time or awarded the equivalent in University-administered funds, e.g., grants, stipends, or fellowships at the University of California in the term for which classification is sought.)

ESTABLISHING INTENT TO BECOME A CALIFORNIA RESIDENT

Indications of your intent to make California your permanent residence can include the following: registering to vote and voting in California elections; designating California as your permanent address on all school and employment records, including military records if you are in the military service; obtaining a California driver's license or, if you do not drive, a California Identification Card; obtaining California vehicle registration; paying California income taxes as a resident, including taxes on income earned outside California from the date you establish residence; establishing a California residence in which you keep your personal belongings; and licensing for professional practice in California. The absence of these indicia in other states during any period for which you claim residence can also serve as an indication of your intent. Your intent will be questioned if you return to your former state of residence when the university is not in session. Documentary evidence is required, and all relevant indications will be considered in determining your classification.

GENERAL RULES APPLYING TO MINORS

If you are an unmarried minor (under age eighteen), the residence of the parent with whom you live is considered to be your residence. If you have a parent living, you cannot change your residence by your own act, by the appointment of a legal guardian, or by the relinquishment of your parent's right of control. If you lived with neither parent, your residence is that of the parent with whom you last lived. Unless you are a minor alien present in the U.S. under the terms of a nonimmigrant visa that precludes you from establishing domicile in the U.S., you may establish your own residence when both your parents are deceased and a legal guardian has not been appointed. If you derive California residence from a parent, that parent must satisfy the one-year durational residence requirement.

SPECIFIC RULES APPLYING TO MINORS

Divorced/Separated Parents

You may be able to derive California resident status from a California resident parent if you move to California to live with that parent on or before your eighteenth birthday. If you begin residing with your California parent after your eighteenth birthday, you will be treated like any other adult student coming to California to establish residence.

Parent of Minor Moves from California

You may be entitled to resident status and not be required to establish financial independence if you are a minor U.S. citizen or eligible alien whose parent(s) was a resident of California who left the state within one year of the residence determination date if:

1. you remained in California after your parent(s) departed;
2. you enroll in a California public post-secondary institution within one year of your parent(s)' departure; and
3. once enrolled, you maintain continuous attendance in that institution.

Two-Year Care and Control

You may be entitled to resident status if you are a U.S. citizen or eligible alien and you have lived continuously with an adult who is not your parent for at least two years prior to the residence determination date. The adult with whom you are living must have been responsible for your care and control for the entire two-year period and must have been residing in California during the one year immediately preceding the residence determination date.

EXEMPTIONS FROM NONRESIDENT TUITION

Member of the Military

If you are an undergraduate student and a member of the U.S. military stationed in California on active duty or the spouse or dependent children, you may be exempt indefinitely from the nonresident tuition fee. Graduate students continue to be eligible for this exception only until they have lived in California one year from the date they arrived in California with ties to the state. You must provide the residence deputy on campus with a statement from your commanding officer or personnel officer stating that your assignment to active duty in California is not for educational purposes. The letter must include the dates of your assignment to the state.

Child or Spouse of Faculty Member

To the extent funds are available, if you are an unmarried dependent child under age twenty-one or the spouse of a member of the university faculty who is a member of the Academic Senate, you may be eligible for a waiver of the nonresident tuition fee. Confirmation of the faculty member's membership on the Academic Senate must be secured each term this waiver is granted.

Child or Spouse of University Employee

You may be entitled to resident classification if you are an unmarried dependent child or the spouse of a full-time university employee whose assignment is outside of California (e.g., Los Alamos National Laboratory). Your parents' or spouse's employment status with the university must be ascertained each term.

Child of Deceased Public Law Enforcement or Fire Suppression Employee

You may be entitled to a waiver of the nonresident tuition fee if you are the child of a deceased public law enforcement or fire suppression employee who was a California resident at the time of his or her death and who was killed in the course of fire suppression or law enforcement duties.

Dependent Child of a California Resident

A student who has not been an adult resident of California for more than one year, and who is the dependent child of a California resident who has been a resident for more than one year immediately prior to the residence determination date, may be entitled to a waiver of the nonresident tuition until the student has resided in California for the minimum time necessary to become a resident so long as continuous attendance is maintained at an institution.

Native American Graduates of a BIA High School

If you are a graduate of a California high school operated by the Federal Bureau of Indian Affairs, you may be eligible for an exemption from the nonresident fee.

Employee of a California Public School District

Any person holding a valid credential authorizing service in the public schools of the state of California who is employed by a school district in a full-time certificate position may be eligible for a nonresident tuition waiver.

Student Athlete in Training at U.S. Olympic Training Center; ARCO

Any amateur student athlete in training at the United States Olympic Training Center in

Chula Vista may be eligible for a waiver of the non-resident tuition until he or she has resided in the state the minimum time necessary to become a resident.

Graduate of California high school

A student who attended high school in California for three or more years (ninth grade included) and graduated from a California high school (or attained the equivalent) may be exempt from nonresident tuition. For eligibility requirements: www.ucop.edu/sas/sfs/ppolicies/UCTEFAQ.PDF.

Surviving Dependents of California Residents Killed in 9/11/01 Terrorist Attack

A student who was a dependent of a California resident who was killed in the September 11, 2001 terrorist attacks on the World Trade Center, the Pentagon Building, or the crash of United Airlines Flight 93. Eligible students must meet the financial need requirements for the Cal Grant A program.

Recipients of the Congressional Medal of Honor

Any undergraduate student who is a recipient of a Congressional Medal of Honor or who is the child of a recipient of the Congressional Medal of Honor. The recipient must be a California resident or must have been a California resident at the time of his or her death. The student may not be older than twenty-seven, and the student's annual income may not exceed the national poverty level.

MAINTAINING RESIDENCE DURING A TEMPORARY ABSENCE

If you are a nonresident student who is in the process of establishing a residence for tuition purposes and you return to your former home during noninstructional periods, your presence in the state will be presumed to be solely for educational purposes and only convincing evidence to the contrary will rebut this presumption. A student **who is in the state solely for educational purposes will NOT be classified as a resident for tuition purposes regardless of the length of his or her stay.**

If you are a student who has been classified as a resident for tuition purposes and you leave the state temporarily, your absence could result in the loss of your California residence. The burden will be on you (or your parents if you are a minor) to verify that you did nothing inconsistent with your claim of continuing California residence during your absence. Steps that you (or your parents) should take to retain a California residence include:

1. Continue to use a California permanent address on all records–educational, employment, military, etc.
2. Satisfy California resident income tax obligations. (Note: If you are claiming California residence, you are liable for payment of income taxes on your total income from the date you establish California residence. This includes income earned in another state or country.)
3. Retain your California voter's registration and vote by absentee ballot.
4. Maintain a California's driver's license and vehicle registration. If it is necessary to change your driver's license and/or vehicle registration while you are temporarily residing in another state, you must change them back to California within the time prescribed by law.

PETITION FOR RESIDENT CLASSIFICATION

You must submit petition and documentation by mail or drop off by the Registrar's Office for a change of classification from nonresident to resident status. All changes of status must be initiated prior to the first day of class for the term for which you intend to be classified as a resident.

TIME LIMITATION ON PROVIDING DOCUMENTATION

If additional documentation is required for residence classification but is not readily accessible, you will be allowed until the end of the applicable term to provide it.

INCORRECT CLASSIFICATION

If you were incorrectly classified as a resident, you are subject to a nonresident classification and to payment of all nonresident tuition fees not paid. If you concealed information or furnished false information and were classified incorrectly as a result, you are also subject to university discipline. Resident students who become nonresidents should immediately notify the campus residence deputy.

INQUIRIES AND APPEALS

Inquiries regarding residence requirements, determinations, and/or recognized exceptions should be directed to the Residence Deputy, Office of the Registrar, 9500 Gilman Drive, La Jolla, CA 92093-0021, or the Legal Analyst-Residence Matters, Office of the General Counsel, University of California, 1111 Franklin Street, 8th Floor, Oakland, CA 94607-5200. **No other university personnel are authorized to supply information relative to residence requirements for tuition purposes.**

Additional information is available in the Office of the Registrar. Please note that changes may be made in the residence requirements between the publication of this statement and the relevant residence determination date. Any student, following a final decision on residence classification by the residence deputy, may appeal in writing to the legal analyst within forty-five days of notification of the residence deputy's final decision.

Payment of Registration Fees

BILLING STATEMENT AND PAYMENT INFORMATION

Registration at UCSD is a two-step process: (1) enrollment in classes and (2) payment of fees. You must enroll first so that your fees can be assessed. You can pay fees anytime after you enroll in classes. A billing statement will be sent to you after enrollment; however, if you wait to enroll just prior to the enrollment deadline, you don't need a billing statement to pay your fees. Write your student ID number on your check and mail it or drop it in the Central Cashier's drop box. Fees are due and payable by the published deadline whether or not a billing statement is received.

Your monthly billing statement from the university will list your credits, including your payments, and your charges. This includes registration fees, housing, parking, and other indebtedness. If you are a financial aid recipient, the funds which are disbursed through UCSD, e.g., Pell Grants, scholarships, and Perkins Loans, will offset against the statement's charges, and you will either pay the remaining amount on the statement or receive a remainder check if there is a credit. If you have any questions about the entries, use the phone numbers listed on the back of the statement to contact the appropriate office.

Billing statements are mailed to students' billing, current, or permanent mailing address.

To make a payment, mail the top of your statement to the Central Cashier's Office at the address provided on the statement stub (9500 Gilman Drive, La Jolla, CA 92093-0009).

If your fees are fully paid by financial aid or other programs and you decide not to attend UCSD, it is very important that you contact your college and initiate withdrawal/leave of absence procedures immediately. Graduate students should refer to the "Graduate Studies" section of the catalog for leave of absence or withdrawal procedures. Failure to do this may result in F grades being assigned to your courses.

Financial Aid/Remainder Check Disbursement

Student financial aid, graduate support, or fee waivers awarded to pay registration fees will be directly credited to your student account and appear on your billing statement as a credit. Financial aid will not be credited to your account until you have completed the enrollment process. Financial aid recipients are expected to be enrolled full-time. Student Business Services will refund all financial aid through direct deposit or be mailed to the current mailing address, these include remainder checks and other forms of financial aid such as all outside agency scholarships and private loans. All federal Perkins Loan borrowers must complete the information sheet and Perkins Loan master promissory note. Loan funds will not be released (credited) to student accounts until the master promissory note is signed. You may complete these documents during your financial aid award and acceptance process, by going to the student business services Web site: http://sbs.ucsd.edu, or in person at the Student Business Services Office.

Loan Counseling

It is required by law and/or university policy that all students receiving Perkins, Stafford (subsidized/unsubsidized), or university loans have a pre-loan counseling session wherein they are informed of the rights, obligations, and consequences attached to the loans. These counseling sessions are called entrance interviews. At these sessions, the students sign documents acknowledging their attendance and understanding of the issues involved. Also, all graduating students and students who withdraw or take a leave of absence who have received a loan must have final counseling before they leave school. These sessions are called exit interviews. At this time, students are individually told how much they owe on student loans, what their repayment amounts will be, and when their repayments will begin. In both sessions, students are provided with copies of all counseling content and documentation. You may complete your entrance interview by going to the student business services Web site: http://sbs.ucsd.edu, or in person at the Student Business Services Office. No appointment is necessary.

Registration and Other Payments through the Central Cashier's Office

Registration payments must be made by mail, e-check, or in the Cashier's Office drop box as early as possible. The Central Cashier's Office receives payments for *all* university debts. The mailing address of the Cashier's Office is: Central Cashier's Office, UCSD, 9500 Gilman Drive, La Jolla, CA 92093-0009. (Make checks or money orders payable to UC Regents.)

INDEBTEDNESS COUNSELING AND BURSAR HOLD RELEASES

Entering college for the first time can be an overwhelming experience. And part of that experience is learning to handle your own finances. Most students have no real problem, but sometimes things can get out of control. University Billing Services staff members will counsel you on campus indebtedness which you have already incurred and how to prevent such conditions in the future. It is the policy of the University of California that no student can continue in the next academic quarter if that individual owes the university money. Consequently, when a student owes the university money, an automatic **hold** prevents him or her from future registration until the bill is paid. It is recognized that there are occasional problems and situations which may be taken into account. Therefore, on occasion, after counseling, the Student Business Services Office may authorize a Time Payment Agreement (TPA) with a student.

TRITON REGISTRATION INSTALLMENT PLAN

The UCSD Triton Registration Installment Plan (TRIP) is available for students who desire an alternative method of financing their registration fees on a short-term basis. All students in good financial and academic standing are eligible for the program, except for those students whose financial aid or graduate support will pay their registration fees. A prerequisite to apply for the program is enrollment for the term. The Triton Registration Installment Plan allows registration fees to be paid in up to three installments each quarter. On a three-month plan, the first payment is required by the quarterly registration due date. The remaining payments are itemized on the student's next two monthly UCSD Billing Statements. There is a $30 per quarter nonrefundable fee that must be submitted with the first payment. This fee is strictly used to offset the costs of the program. Applications may be picked up at the Student Business Services Office or downloaded via the SBS Web site at: www-bfs.ucsd.edu/sbs.

LOCATION

The Student Business Services (SBS) Office is located in Building 201 in the University Center, across the street from the Office of Admissions and Registrar. The Central Cashier's Office is at the intersection of Myers and Rupertus Drives in Building 401 University Center.

OFFICE HOURS

The Central Cashier's Office is open from 8:00 a.m. until 4:00 p.m.

The Student Business Services Office is open from 8:00 a.m. until 4:30 p.m.

DEADLINES AND PENALTY FINES

Students should refer to StudentLink for actual deadline dates.

All prior delinquent debts must also be paid. Health insurance is mandatory for all students, both graduate and undergraduate, as a condition of enrollment. All students will be assessed the cost of the policy provided by the campus. Undergraduates who already have adequate health insurance should access StudentLink to request a waiver of this premium. An additional charge will be made for failure to pay required fees or deposits by the dates announced in this catalog and on StudentLink. Please note that students who enroll in courses but fail to pay fees by the published deadline will be assessed a late payment fee. Students who fail to enroll in courses prior to the enrollment deadline will be assessed a late enrollment fee and a late payment fee. Currently these fines are $50 each. (See "Miscellaneous Expenses" on the next page.)

With the exception of appeals to the legal analyst regarding a student's residence classification, no claim for remission of fees will be considered unless such claim is presented during the fiscal year to which the claim is applicable.

Receipts are issued for all payments, and these should be carefully preserved. No student

will be entitled to a refund except after surrender to the Cashier's Office of the student's original receipt, if issued, or cancelled check or money order receipt.

EXEMPTION FROM FEES

Except for miscellaneous fees and service charges, no fees of any kind are assessed any surviving child of a California resident who was an active law enforcement or active fire suppression official and who was killed in the performance of active duties or died as a result of an accident or injury caused by external violence or physical force incurred in the performance of such duties.

No fees of any kind are assessed a student who was a dependent of a California resident who was killed in the September 11, 2001 terrorist attacks on the World Trade Center, the Pentagon Building, or the crash of United Airlines Flight 93. Eligible students must meet the financial need requirements for the Cal Grant A program. No fees of any kind are assessed any undergraduate student who is a recipient of a Congressional Medal of Honor or who is the child of a recipient of the Congressional Medal of Honor. The recipient must be a California resident or must have been a California resident at the time of his or her death. The student may not be older than twenty-seven, and the student's annual income may not exceed the national poverty level.

Students who believe themselves entitled to one of these exemptions must apply for a fee exemption at the Office of the Registrar before registering. Without this authorization, students will not be permitted to register without payment of the entire fee. Graduate students should apply to the dean of Graduate Studies.

NONRESIDENT TUITION

Students who have not established and maintained California residence for at least one year immediately prior to the residence determination date for the term during which they propose to attend the university, and who do not otherwise qualify for resident classification under California law, are charged, along with other fees, a nonresident tuition fee each quarter. The residence determination date is the day instruction begins at the last of the University of California campuses to open for the quarter. Final classifications are made by the residence deputy, who is located in the registrar's office, on the basis of a Statement of Legal Residence completed by the student and signed under oath. Prospective students who have questions regarding their residence status should consult the *General Catalog* or contact the residence deputy.

UNIVERSITY REGISTRATION FEE

The university registration fee is $713 per year for undergraduates and must be paid at the time of registration. It covers services that benefit the student and are complementary to, but not a part of, the instructional program, and it includes recreational activities, student organizations, and the Student Health Service. No part of this fee is refunded to students who do not make use of these privileges.

In addition, there is a campus activity fee of $63 per year for undergraduates, a university center fee of $112.50 per year for all students to be used for the construction and operation of the student centers, a $276 per year recreational facility fee, and college activity fees of $21, $15, $21, $24, and $6 per year for Muir, Eleanor Roosevelt, Revelle, Sixth, and Thurgood Marshall Colleges, respectively.

EDUCATIONAL FEE

The educational fee was established by the regents for all students beginning fall quarter 1970. The educational fee is a charge assessed against each registered student to cover part of the cost of the student's education at the University of California. The educational fee is $4,271 per year for resident undergraduates, $4,506 per year for resident graduates, and $4,751 for all non-resident students. The educational fee may be reduced by one-half for students approved on part-time status.

MISCELLANEOUS EXPENSES, FEES, FINES, AND PENALTIES

Books and supplies average about $469 per quarter. However, students should be aware of the following possible expenses:

Statement of Intent to Register fee (new undergraduate)	$100
Application fee (one campus)	40
Each additional campus	40
Duplicate Photo I.D. Card	15
Transcript of record	6
Verification of Student Data/Status	6
Muir Activity (per quarter)	7
Eleanor Roosevelt (per quarter)	5
Revelle Activity (per quarter)	7
Sixth College Activity (per quarter)	8
Thurgood Marshall Activity (per quarter)	2
Late enrollment	50
Return check collection	35
Return e-check collection	35
Late payment of fees (late registration)	50
Duplicate diploma	25
Statement late charge	25

(See also "Withdrawal from the University.")

RETURNED CHECK POLICY

Several facilities at UCSD accept personal checks for payments and/or cash. Any individual who writes checks with insufficient funds will be subject to all legal action deemed appropriate by the university. In addition, anyone who writes to the university three or more checks that are subsequently returned will have their check writing privileges permanently revoked.

PARKING

Students who park motor vehicles on the campus are subject to parking fees. Parking permits may be purchased through StudentLink or at the Cashier's Office. A copy of the campus parking regulations may be obtained from the cashier at the time of permit purchase.

Part-Time Study at the University of California

GENERAL POLICY

1. Degree programs in the university may be open to part-time students wherever good educational reasons exist for so doing.
2. No majors or other degree programs will be offered only for part-time students, except as specifically authorized by the Academic Senate.
3. For the purposes of this statement of policy and procedures, the following definition applies:

A part-time undergraduate student is one who is approved to enroll for ten units or fewer, or an equivalent number of courses, per quarter.

ADMISSIONS AND ENROLLMENT

1. The same admissions standards that apply to full-time students will apply to part-time students.
2. Approval for individual students to enroll on a part-time basis will be given for reasons of occupation, family responsibilities, health, or, for one time only, graduating senior status.

3. Approval to enroll as a part-time student shall be given by the appropriate dean or provost.
4. Students must apply for part-time study prior to the end of the second week of the quarter *and* must be enrolled in ten or fewer units at that time (*including* any units taken through UCSD Extension) to qualify for reduced fees.

PROCEDURES

Students must apply for part-time status on the Part-Time Study application form available at their colleges *prior to the end of the second week of the quarter.* Approval for part-time study is granted for one academic year only–fall through spring quarters, winter through spring quarters, or spring quarter only. Students must reapply for approval each fall quarter and substantiate reasons for request. Approval for part-time study will automatically exempt students from the thirty-six unit-per-year minimum progress requirement. Students who are receiving financial assistance should contact their college financial aid office regarding eligibility requirements.

REDUCED FEES

Undergraduate students who have been approved for part-time study and who are enrolled in ten units or fewer at the end of the second week of classes are eligible for a reduction of one-half of the educational fee and one-half of nonresident tuition, if applicable. Students who drop to ten or fewer units after this date will receive no reduction, and any student who receives a reduction in fees will be billed for the difference if the number of units increases to ten and one-half or more anytime in the quarter.

Undergraduates enrolled in Education Abroad and other special programs are excluded from this reduced fee policy. Employees of the university enrolled as students in the Employee Program have fees reduced by waiver from the Personnel Office and are not eligible to receive this further reduction. Extension courses taken by students in the Complimentary Enrollment Program *will* be included in the unit count whether or not the credit is accepted as part of a university degree program. Questions concerning this policy may be addressed to the Office of the Registrar.

Undergraduate Degree Requirements

Each of the undergraduate colleges on the San Diego campus has specific requirements for a degree. (See "Choosing a College at UCSD.")

Changes in Requirements

It is campus policy to introduce changes in graduation requirements so that students who began higher education (at UCSD or elsewhere) before the change will not be hindered substantially in the orderly pursuit of their degrees. This principle will have different implications for different kinds of requirement changes. To find out about the implications of particular changes, students should check with colleges, departments, or other sources of information.

Students transferring to UCSD from another UC campus who have completed their lower-division general-education requirements at a UC campus are considered to have met UCSD's lower-division general-education requirements at Thurgood Marshall College, Warren College, and John Muir College. A letter certifying satisfaction of general education requirements under the UC reciprocity agreement must be sent to the Academic Advising Office of the student's college. UCSD upper-division general education requirements must be satisfied. (See "Graduation Requirements" for each undergraduate UCSD college.)

Students transferring to UCSD from California Community College campuses may elect to satisfy their lower-division general-education and breadth requirements prior to transfer by completing general-education/breadth requirements using the UCSD Articulation Agreement on file at the California Community Colleges; following the Intersegmental General Education Transfer Agreement; or signing a TAG (Transfer Admission Guarantee) contract and completing TAG requirements prior to entering UCSD. See "New University of California Transfer Agreements" in the "Undergraduate Admissions, Policies and Procedures" section of this catalog.

Requirements for the Bachelor's Degree

All course work required for a degree must be completed by the end of the quarter filed for graduation.

Every candidate for a bachelor's degree must have completed a major.

1. A major shall require the equivalent of twelve or more upper-division courses (forty-eight or more units).
2. Requirements for majors shall be determined by departments and programs, subject to the approval of the Committee on Educational Policy.
3. **Double Majors:** With the approval of both departments or programs and of the college provost, a student may declare a double major after reaching junior level (90 UC units) and no later than 135 units, with a minimum cumulative grade point average of 2.50.
   a. A student with a double major must fulfill the separate requirements of each major, and the equivalent of at least ten upper-division courses (forty units) must be unique to each major. Courses taken in fulfillment of lower-division requirements may overlap to any degree.
   b. The two majors may not be within the School of Engineering, nor, except with the approval of the Committee on Educational Policy, within a single department. When a department major is combined with a major in an interdepartmental or interdisciplinary program, the ten courses counted as unique in the interdepartmental or interdisciplinary program must all be drawn from outside the departmental major.
   c. A student who has declared a double major is not subject to the maximum-unit limitations of Regulation 600.C. and may accrue up to 240 units.
   d. A student with a double major may graduate only upon completion of all requirements for both majors. Both majors will be noted on the student's transcript

and diploma. If the two majors lead to different degrees (B.A. and B.S.), that fact will be noted on the transcript, and the two degree designations will appear on one diploma.

e. A student who has declared a double major may graduate in one major upon completion of all requirements for that major, but may not continue in the University for completion of the second major.

4. An undergraduate student must have declared a major or pre-major upon completion of ninety units.

Other requirements for graduation shall be determined by the colleges in conformity with universitywide regulations and subject to approval by the San Diego Division of the Academic Senate.

American History and Institutions

A knowledge of American history and of the principles of American institutions under federal and state constitutions is required of all candidates for the bachelor's degree. This requirement may be met in any one of the following ways:

1. By having passed with a grade of C or better one high-school unit in American history, or one-half high-school unit in American history and one-half high-school unit in civics or American government.
2. By completing with a grade of P or C– or better any one-quarter course of instruction accepted as satisfactory by the Committee on Educational Policy and Courses. Any of the following courses are suitable for fulfilling the requirement: HILD 2A-B-C, HILD 7A-B-C, or any course listed under HIUS (other than HIUS Colloquia); Political Science 10, 100A, 100B, 100C, 102C, 102H, 104A, 110EA-EB, 110J, 142A; and Ethnic Studies 112A-B, 125, 130, 131, 149, 167, 170A-B.
3. By presenting proof of having received a score of 550 or more on the SAT II Subject Test of the College Entrance Examination Board (CEEB) in American History.
4. By presenting proof of having received a grade of 3 or higher on the Advanced Placement Test in American History administered by the Educational Testing Service, Princeton, New Jersey.
5. By presenting proof of having satisfied the present requirement as administered at another collegiate institution within the state.
6. By presenting proof of successful completion of an acceptable one-quarter or one-semester course, with a grade of C or better, in either American history or American government at a community college within the state.
7. By presenting proof of successful completion of an acceptable one-quarter or one-semester course, with a grade of C or better, in either American history or American government at a recognized institution of higher education, junior college included, in another state.
8. An alien attending the university on an F-1 or J-1 student visa may, by showing proof of temporary residence in the United States, petition for exemption from this requirement through the office of his or her college provost.

SUBJECT A: ENGLISH COMPOSITION

The University of California requires all undergraduate students (including international students) to demonstrate a minimum proficiency in English composition (the Subject A requirement). This proficiency can be demonstrated by:

1. Submitting a score of 680 or better on either the Writing Test, English Composition, or the English Composition with Essay Test, SAT II Subject Tests of the College Entrance Examination Board (CEEB) (Note: not to be confused with the verbal portion of the Scholastic Assessment Test [SAT I]); or
2. Submitting a score of 3, 4, or 5 on the CEEB Advanced Placement Test in English; or
3. Submitting a score of 5 or better in the International Baccalaureate Higher Level examination in English (Language A only); or
4. Submitting proof of completion, prior to enrollment at UCSD, of an acceptable transfer-level college course of four quarter-units or three semester-units in English composition with a grade of C or better; or
5. Writing a passing essay on the Subject A Proficiency Test (which is *required* of all students who have not otherwise met the requirement). This exam is administered statewide during May and on campus at the start of fall quarter. *This examination may be taken only once.*

All students who have not previously satisfied the Subject A requirement must take the Subject A Proficiency Test prior to enrollment at UCSD. Students who fail this examination must enroll each quarter in an approved Subject A course until they satisfy the Subject A requirement. Students satisfy the requirement by achieving a grade of C or better in SDCC 1 (English Composition–Subject A) and by passing the Subject A Exit Examination at the end of SDCC 1. The Exit Examination is administered by the Subject A Program office. Students whose performance on the Subject A Proficiency Test indicates they need work in English as a Second Language must enroll in ESL courses for three quarters (or until released by the ESL director) before enrolling in SDCC 1. Students must enroll in SDCC 1 (or ESL) during their first quarter of residence at UCSD. For further information on SDCC 1, refer to "Subject A" in the catalog section "Courses, Curricula, and Programs of Instruction." For further information on ESL, see "English as a Second Language" in the catalog section "Courses, Curricula, and Programs of Instruction."

The Subject A requirement must be satisfied during a student's first year of residence. Students will be barred from enrollment at the university if they fail to satisfy the Subject A requirement by the end of their third quarter of enrollment at UCSD. (Exception: Students in need of ESL course work may have up to three extra quarters of residence in which to satisfy the Subject A requirement.)

Students will not be allowed to enroll in university-level writing courses at UCSD until the Subject A requirement has been satisfied.

Students who have been barred from enrollment because of failure to satisfy Subject A will be allowed to present evidence of further work in composition. If the Subject A director approves, these students may take a Subject A examination a final time. Students performing successfully on this final examination will be eligible to apply for re-enrollment at the university.

For further information about the Subject A requirement or the Proficiency Test, please visit the Subject A Program office, 3232 Literature Building, or call (858) 534-6177.

Senior Residence

Each candidate for the bachelor's degree must complete thirty-five of the final forty-five units in residence in the college or school of the University of California in which the degree is to be earned.

Under certain circumstances exceptions may be granted by the provost, such as when a student attends classes on another UC campus as an approved visitor or participates in the UC Education Abroad, the UCSD Opportunities Abroad, Dartmouth, Spelman, Morehouse, or University of New Mexico exchange programs.

Note: Courses taken through the UCSD Extension Concurrent Enrollment Program will not apply toward a UCSD student's senior residency requirement. For further details see "Graduation Requirements" in the Index.

Maximum Unit Limitation

1. An undergraduate student may register for no more than 200 course units. An exception is permitted for candidates for B.S. degrees in engineering, for whom the limits are 240 units in Revelle and Roosevelt Colleges and 230 units in all other colleges. Other exceptions will be granted only for compelling academic reasons and only with the approval of the college provost and the concurrence of the Committee on Educational Policy.
2. Transfer units applicable toward general-education requirements or major requirements are included in the maximum unit calculation; all other transfer units are excluded. Advanced Placement and international baccalaureate units are excluded.

Special kinds of study–e.g., laboratories, reading programs, studio work–may be required in addition to the basic course work in given curricula.

Graduation Credit for Physical Education Courses

No more than three units of physical education, whether earned at UCSD or transferred from another institution, may be counted toward graduation.

Undergraduate Minors and Programs of Concentration

A minor curriculum–or "minor" for short–is a set of courses on a well-defined subject. For students entering after January 1, 1998: a minor shall consist of at least twenty-eight units, of which at least twenty units must be upper-division. For sound academic reasons and with the approval of the Committee on Educational Policy, a minor may be established with fewer than twenty upper-division units. In the case of a subject that is the responsibility of a particular department, such as literature, physics or sociology, that department specifies which courses are acceptable for a minor curriculum in its section of this General Catalog. All other minor curricula must be approved by the Committee on Educational Policy and be published in this General Catalog. A student may not apply toward the minor any upper-division course that has been used to satisfy the requirements of his or her major curriculum. A student's successful completion of a minor curriculum will be recorded on his or her transcript at graduation.

Certain colleges require their students to complete one or more "programs of concentration" before graduation, and the courses or types of courses acceptable for programs of concentration are determined by the faculty of the college or a subcommittee thereof. A program of concentration is not necessarily a minor. Indeed, a program of concentration is a minor only if it meets the criteria in the above paragraph, and only then may it be listed on a student's transcript as a minor. Otherwise it will be recorded as a concentration at graduation.

Honors

COLLEGE HONORS AT GRADUATION

The Academic Senate has established the following standards for award of college honors at graduation:

There shall be a campus-wide requirement for the award of college honors at graduation. No more than 14 percent of the graduating seniors on campus shall be eligible for college honors. Normally, no more than the top 2 percent shall be eligible for summa cum laude and no more than the next 4 percent for magna cum laude, although minor variations from year to year shall be permitted. The remaining 8 percent are eligible for cum laude. The ranking of students for eligibility for college honors shall be based upon the grade-point average. In addition, to be eligible for honors, a student must receive letter grades for at least eighty quarter-units of course work at the University of California. Each college may award honors at graduation only to those who are eligible to receive college honors.

DEPARTMENT HONORS

Each department or program may award honors to a student at graduation in accordance with the following criteria:

1. The student must have completed a *special* course of study within the department or program. The requirements for this *special* course of study shall be approved by the divisional Committee on Educational Policy and published in the catalog. The requirements must include 8–12 units of supervised research or other creative activity leading to the preparation of a paper or other appropriate project. Public presentation of the project, through performance, participation in the undergraduate research conference, or other appropriate means, shall explicitly be encouraged.
2. The department or program shall establish formal procedures and criteria for application and admission to the program, which shall normally include a GPA of 3.5 in the major as a prerequisite. Students with a GPA lower than 3.5 may be admitted by exception if they show promise of success in research or creative activity.
3. Each student whose project earns the equivalent of a grade of "B" or better and who has maintained a GPA of at least 3.25 in the major shall be entitled to the designation "with distinction" on the diploma after the departmental or program name. Subject to the approval of the Committee on Educational Policy, each department or program shall establish criteria for the award of the designations "with high distinction" and "with highest distinction."

Honors awarded by departments may be designated on the diploma by the words "with distinction," "with high distinction," and "with highest distinction" after the departmental or program name. Currently the departments and majors listed below are approved to award honors to graduating seniors: Anthropology, Biology, Chemistry, Chinese Studies, Classical Studies, Cognitive Science, Communication, Critical Gender Studies, Earth Sciences, Economics, Electrical and Computer Engineering, German Studies, History, Human Development, International Studies, Japanese Studies, Judaic Studies, Linguistics, Literature, Management Science, Muir Special Project, Music, Philosophy, Physics, Political Science, Psychology, Roosevelt Individual Studies, Sociology, Study of Religion, Theatre and Dance, Urban Studies and Planning, and Visual Arts.

PROVOST HONORS

Provost honors are awarded quarterly based upon the completion of twelve graded units with a GPA of 3.5 or higher with no grade of D, F, or NP recorded for the quarter.

PHI BETA KAPPA

Phi Beta Kappa is the oldest and most prestigious academic honor society for the liberal arts and sciences in America. UCSD is one of only 265 four-year institutions that have been granted chapters since the society was founded in 1776. In addition, there are approximately fifty active PBK alumni associations in major cities around the country.

More than 200 UCSD faculty and staff were initiated at their own undergraduate colleges, and they make up the local chapter, Sigma of California. Each spring the campus chapter elects student members on the basis of high scholastic achievement and breadth of academic background. The minimum criteria for membership, evaluated at the end of winter quarter, include:

1. Successful completion of at least 160 quarter-units by the time of consideration and at least junior standing.
2. Cumulative GPA of 3.65 or higher for work at UCSD. GPAs from transfer work are considered, but the GPA at UC must be at least 3.65, as must the overall GPA. (Juniors are rarely invited into Phi Beta Kappa, and they are held to higher standards, including a minimum GPA of 3.80.)
3. A minimum of five courses in the humanities or equivalent subjects, explicitly excluding performance or studio courses as required by the National Society.
4. At least one year of college-level course credit in a second language or officially demonstrated equivalent literacy and proficiency.
5. At least one year of college-level course credits in mathematics, quantitative science, logic, or statistics (not all science courses fulfill this requirement).
6. Full-time enrollment at UCSD for at least two years.

As required by the National Society of Phi Beta Kappa, when they consider a student for membership the reviewers examine the excellence of the individual's academic record, the breadth and quality of the courses taken, and evidence that the student has pursued a serious line of work and is of good character. Invitations to membership are sent by email and by letter to each student's permanent address, as maintained by the student on StudentLink. Letters are sent in mid-May, and initiation takes place in early June.

Application for Degree

Undergraduate seniors are required to file a Degree and Diploma Application form with their college academic advising office. Students should check with their college academic advising office for exact deadlines. Advising and counseling sessions should take place well before the quarter of graduation to ensure all degree requirements will be satisfied. Applications not on file by the deadline are subject to special approval, a $3 late filing fee, and a $25 special-order diploma fee. Students who have not completed all degree requirements by the end of the quarter filed for graduation must file a new application. Failure to file this petition may delay the graduation date and receipt of diploma.

Specific Regulations

Progress toward Degrees

In order to apply the units of a course toward unit requirements for a degree, a student must receive an A, B, C, D, P, or S grade in the course. (Plus or minus suffixes (+/–) may be affixed to A, B, and C.) Further, an undergraduate student must have a 2.0 or higher grade-point average (GPA) to receive a bachelor's degree, and a graduate student must have a 3.0 or higher GPA to receive a higher degree.

Probation

An undergraduate student is subject to academic probation if at the end of any term his or her GPA for that term or his or her cumulative GPA is less than 2.0.

Subject to Disqualification

An undergraduate student is subject to academic disqualification from further registration if at the end of any term his or her GPA for that term is less than 1.5 or if he or she has completed two successive terms on academic probation without achieving a cumulative GPA of 2.0. Continued registration of an undergraduate who is subject to disqualification is at the discretion of the faculty of the student's college or its authorized agent (generally the provost/Office of the Provost).

If a student is not currently in scholastic good standing or has been denied registration for the next ensuing quarter on the date on which he or she left the university, a statement of his or her status shall accompany his or her transcript. A student who has been disqualified from further registration at the University of California may not register for UCSD courses through Summer Session, through UCSD Extension by way of the concurrent enrollment mechanism, or in UCSD Extension courses offered at the 100 level. Students receiving financial assistance should refer to information in the Financial Aid section of this catalog. Unique scholarship eligibility requirements must be met.

Note: Veteran students receiving financial assistance from the Veterans Administration should refer to unique requirements set by state approving agencies. See veterans' information under Financial Aid.

Minimum Progress

A full-time undergraduate student is subject to disqualification from further registration if he or she does not complete thirty-six units in any three consecutive quarters of enrollment. Continued registration of an undergraduate who is subject to disqualification due to lack of minimum progress is at the discretion of the faculty of the student's college or its authorized agent (generally the provost/Office of the Provost).

Eligible students may file for an exemption from the minimum progress requirement by completing the Part-time Study application and receiving college approval prior to the end of the second week of the quarter. (See "Part-time Study at the University of California.")

Double Majors

See "Requirements for the Bachelor's Degree" in this section.

Repetition of Courses

Repetition for credit of courses not so authorized by the appropriate Committee on Courses is allowed subject to the following limitations:

1. A student may *not* repeat a course for which a grade of A, B, C, I, P, or S is recorded on his or her transcript. (Plus or minus suffixes (+/–) may be affixed to A, B, and C.)

2. Courses in which a grade of D or F has been awarded may not be repeated on a P/NP or S/U basis. (Graduate students must petition and receive approval in-advance to repeat a course for credit.)
3. Undergraduate students may repeat a course in which a grade of NP has been awarded for a P/NP or letter grade, if applicable. Graduate students may repeat a course in which a grade of U has been awarded on an S/U basis only.
4. Repetition of a course for which a student's transcript bears two or more entries with grades among D, F, NP, or U requires approval of the appropriate provost or dean.
5. All grades received by a student shall be recorded on the student's transcript.
6. The first sixteen units of courses that have been repeated by an undergraduate student and for which the student has received a grade of D, F, or NP, shall not be used in grade-point calculations, unless the course is repeated by a student who has admitted to or been found guilty of academic dishonesty; in which case, the units for both the initial course and the repeated course shall be counted in grade-point calculations.

Note: Although the University of California grade-point average will not include these repeated courses, other institutions/graduate programs, and agencies may recalculate the grade-point average to reflect all assigned grades.

Special Studies Courses

Subject to the limitations below, a student may earn credit for supervised special studies courses on topics of his or her own selection. An undergraduate taking one or more special studies courses must complete an application for each such course before the start of the course.

COURSE NUMBER

Ordinarily, special studies courses are numbered 97, 98, or 99 for lower division and 197, 198, or 199 for upper division. The 97 and 197 courses are for individually arranged field studies. The 98 and 198 courses are for directed group study. The 99 and 199 courses are for individual independent study.

LIMITATIONS

1. Enrollment requires the prior consent of the instructor who is to supervise the study and the approval of the department chair. The applicant shall show that his or her background is adequate for the proposed study.
2. A student must have completed at least thirty units of undergraduate study at UCSD and must have attained a UCSD grade-point average of at least 3.0 to enroll in a lower-division special studies course, and at least ninety units of undergraduate study and must have attained a grade- point average of at least 2.5 to enroll in an upper-division special studies course.
3. A student may enroll for no more than a total of four units of 98, 99, 198, and 199 Special Studies courses in one term.
4. Except as may otherwise be authorized by the CEP Subcommittee on Courses (e.g., for honors programs), only a grade of P or NP is to be assigned for undergraduates enrolled in any special studies course.
5. Subject to the approval of the CEP Subcommittee on Undergraduate Courses, a department may impose additional limitations on its supervised special studies courses.

EXCEPTIONS

On the advice of the instructor(s) and the department chair concerned, the provost of a student's college may authorize exceptions to the limitations (2) and (3) listed above.

PROCEDURES

1. Students must complete an "Application for UCSD Special Studies Course Enrollment," available in department offices, and secure instructor and department chair approval.
2. Students must submit an approved form to the Office of the Registrar to enroll in a special studies course.

Undergraduate Assistance in Courses

An undergraduate instructional apprentice is an undergraduate student who serves as an assistant in an undergraduate course under the supervision of a faculty member. The purpose of the apprenticeship is to learn the methodology of teaching through actual practice in a regularly scheduled course.

GUIDELINES

1. An undergraduate instructional apprentice shall be an upper-division student. He or she shall be involved only with lower-division courses.
2. Students are not permitted to assist in courses in which they are enrolled.
3. An undergraduate instructional apprentice must have a minimum grade-point average of 3.0. Departments may establish higher grade-point average requirements.
4. The faculty instructor is responsible for course content and for maintaining the overall quality of instruction, including supervision of undergraduate instructional apprentices. The faculty instructor is responsible for all grades given in the class.
5. The instructor is expected to meet regularly with the undergraduate apprentice to evaluate the student's performance and to provide the direction needed for a worthwhile educational experience.
6. An undergraduate instructional apprentice may receive credit on a Pass/Not Pass basis only (through registration in a 195 course), subject to approval by the Committee on Educational Policy.
7. A student may not be an instructional apprentice more than once for the same course for credit.
8. A student may not be an instructional apprentice in more than one course in a quarter.
9. The total credit accumulated as an apprentice shall not exceed eight units.

PROCEDURE

All departments/programs using undergraduate instructional apprentices shall submit to CEP a description of the role of the undergraduate instructional apprentice, as part of the petition for approval. Any deviation from the guidelines above must be explained and justified in a memo accompanying the petition. Any major change in the function or duty of the apprentice in a course should also be approved by CEP. **All UGIA applications must be received and approved by the CEP prior to the start of the quarter in which the student is to apprentice.**

Writing Requirements

A student may register in an upper-division course only if the student has satisfactorily completed the writing requirement of his or her college or has obtained the consent of the instructor of the upper-division course. The requirement is waived for a student who has been admitted as

a transfer student and has not completed three quarters of residence at UCSD.

Final Examinations

Final examinations are obligatory in all undergraduate courses except laboratory courses, or their equivalent, as individually determined by the Committee on Courses.

Each such examination shall be conducted in writing whenever practical and must be completed by all participants within the announced time shown in the *Enrollment Information and University Policies* (located on StudentLink) for the quarter in question. These examinations may not exceed three hours in duration.

In laboratory courses, the department concerned may, at its option, require a final examination subject to prior announcement in the *Enrollment Information and University Policies* (located on StudentLink) for the term.

Religious Accommodation

It is the policy of the university to make reasonable efforts to accommodate students having bona fide religious conflicts with scheduled examinations by providing alternative times or methods to take such examinations. If a student anticipates that a scheduled examination will occur at a time at which his or her religious beliefs prohibit participation in the examination, the student must submit to the instructor a statement describing the nature of the religious conflict and specifying the days and times of conflict.

1. For final examinations, the statement must be submitted no later than the end of the second week of instruction of the quarter.
2. For all other examinations, the statement must be submitted to the instructor as soon as possible after a particular examination date is scheduled.

If a conflict with the student's religious beliefs does exist, the instructor will attempt to provide an alternative, equitable examination which does not create undue hardship for the instructor or for the other students in the class.

Policy on Final Examinations

a. Academic Senate Regulations specify that final examinations are required in all undergraduate courses, unless an exception has been approved by CEP or the CEP Subcommittee on Undergraduate Courses. Final examinations are, however, normally not required in laboratory courses.
b. Final examinations may not be given at any time before examination week without explicit approval of CEP.
c. Although the instructor may give a final examination at an alternative time during final examination week with the approval of CEP, students must be permitted to take an equivalent examination at the originally scheduled time if they so desire.
d. An instructor may administer an examination at an alternative time if a valid reason is given by the student for not taking the regularly scheduled examination. Valid reasons include: serious illness and family disasters. Rescheduling as a result of a religious obligation is governed by the UCSD Policy on Religious Accommodation.
e. No student may be excused from assigned final examinations.
f. A final examination must, whenever practicable, be written and must be completed by all participants within a previously announced time limit.
g. Final examinations in non-laboratory courses may not exceed three hours duration.
h. No instructor may require a "take-home" final examination be turned in before the date and hour at which the examination for the course was scheduled by the Registrar's Office.
i. Faculty members (including visiting faculty) must be available to students during final examination week up to the time when the final examinations of their courses are given and, physically present in the examination room for the entire final examination, except in special cases when an exam is given in more than one room. In cases where the approved absence of a course instructor cannot be avoided, the department chair or program director must seek CEP approval to designate another faculty member to administer the final examination. Nevertheless, faculty course instructors themselves must assign grades for the courses they teach.
j. CEP will not recommend approval of faculty absences during finals week unless arrangements to administer the final examination have been worked out in advance with the department chair or program director.

Policy on Midterm Examinations

a. Faculty are obliged to have printed in the *Schedule of Classes* the date and time of any midterm which is to be given outside of the regularly scheduled class hours (beginning with the winter 2001 *Schedule of Classes*).
b. Additionally, any midterm given outside of the regularly scheduled class hours must be announced in a syllabus distributed to the class at the beginning of the quarter.

Retention of Examination Papers

Instructors are required to retain examination papers for at least one full quarter following the final examination period, unless the papers have been returned to the students.

Credit by Examination

With the instructor's approval and concurrence by the student's provost, a currently enrolled and registered undergraduate student in good standing may petition to obtain credit for some courses by examination. Credit by examination is intended for students who study the course material on their own and then petition for credit by examination when they feel they are prepared. The examination will cover work for the entire course. Except as authorized by the instructor and appropriate provost, credit by examination may not be used to repeat a grade of D, F, or W. A part-time student who, by registering to take a course credit by examination, surpasses the number of units allowed for part-time status must pay fees as a full-time student. There will be a $5 fee for each Credit by Examination petition.

Use of Student Petition

For exceptional circumstances, students may request approval for variances to regulations and policies. This should be done by filling out an Undergraduate Student Petition (available on StudentLink, in the provosts' offices, or the Office of the Registrar), securing the necessary approvals, and filing the petition with the appropriate department or college academic advising office.

Grading Policy

Grades in undergraduate courses are defined as follows: A, excellent; B, good; C, fair; D, poor; F,

fail; I, incomplete (work of passing quality but incomplete for good cause); and IP (In Progress). The designations P (Pass) and NP (Not Pass) are used in reporting grades for some undergraduate courses. P denotes a letter grade of C– or better. A blank grade indicates no record or no report of grade was received from the instructor. W is recorded on the transcript indicating the student withdrew or dropped the course sometime after the beginning of the fifth week of a quarter.

Note: Students who drop certain laboratory courses after the second scheduled meeting period will receive a W grade.

Instructors have the option of assigning plus (+) and minus (–) suffixes to the grades A, B, and C. This option became available as of fall 1983.

Grade Points

For each student, the registrar will calculate a grade-point average (GPA) over courses taken at any campus of the University of California, not including Extension courses. Grade points per unit will be assigned as follows: A=4, B=3, C=2, D=1, F=0. When attached to the grades of B and C, plus (+) grades carry three-tenths of a grade point more per unit. The grade of A+, when awarded, represents extraordinary achievement but does not receive grade-point credit beyond that received for the grade of A. When attached to the grades of A, B and C, minus (–) grades carry three-tenths of a grade point less per unit than the unsuffixed grades. Courses in which an I, IP, P, NP, S, U, or W grade has been awarded will be disregarded in grade-point calculations. A graduate student's GPA will be calculated over courses taken while in graduate standing.

Grade	Grade Points	Grade	Grade Points
A+	4.0	C+	2.3
A	4.0	C	2.0
A–	3.7	C–	1.7
B+	3.3	D	1.0
B	3.0	F	0
B–	2.7		

The grade-point average is computed by dividing the total number of grade points earned by the total unit value of letter-graded courses completed.

At the end of each quarter, the instructor of each course will assign a letter grade to each student who was enrolled in that course at the end of the ninth week of instruction on the basis of the work required for the entire course. An I grade may be assigned if appropriate.

Changes in Grades

All grades except I and IP are final when filed by instructors on end-of-term grade reports. However, a final grade may be corrected when a clerical or procedural error is discovered. No change of a final grade may be made on the basis of revision or augmentation of a student's work in the course. No term grade except Incomplete may be revised by further examination. No grade may be changed after one calendar year from the time it was recorded. Petitions for exceptions are referred to the Committee on Educational Policy.

No Report/No Record

A blank entry appearing on student transcripts in lieu of a grade indicates that no grade was assigned by the instructor. A blank entry will lapse automatically into an F, NP, or U if not replaced by a final grade by the last day of instruction of the subsequent quarter, and will be computed in the student's GPA.

Pass/Not Pass

The Pass/Not Pass option is designed to encourage undergraduate students to venture into courses which they might otherwise hesitate to take because they are uncertain about their aptitude or preparation. Consistent with college policy, an undergraduate student in good standing may elect to be graded on a P/NP basis in a course. No more than one-fourth of an undergraduate student's total UCSD course units may be graded on a P/NP basis. Departments may require that courses applied toward the major be taken on a letter-grade basis. Enrollment under this option must take place within the first four weeks of the course. A grade of Pass shall be awarded only for work which otherwise would receive a grade of C- or better. Units passed shall be counted in satisfaction of degree requirements, but such courses shall be disregarded in determining a student's grade-point average. (See "Physical Education Credit toward Graduation.")

If students wish to change their selected grading option after enrolling, they may use WebReg in StudentLink, or complete an Add/Change/Drop card and file it at the Registrar's Office. The last day to change grading options is the end of the fourth week of instruction.

Only a grade of P or NP is to be assigned for courses numbered 195, 197, 198, and 199. Subject to the approval of the CEP Subcommittee on Undergraduate Courses, departments may impose additional limitations or restrictions.

Only a grade of P or NP is to be assigned an undergraduate student's work in a noncredit (0-unit) course.

Note: See "Choosing a College at UCSD" section for further information regarding the P/NP grading option.

The W Grade

When a student withdraws from the university or drops a course, other than a laboratory course, between the beginning of the fifth week of instruction and the end of the ninth week of instruction of a quarter, the registrar will assign a W to the student for each course affected. Only the registrar may assign a W.

Note: Students who drop certain laboratory courses after the second scheduled meeting period will receive a W grade.

Courses in which a W has been entered on the student's transcript will be disregarded in determining a student's grade-point average.

ADDING AND DROPPING COURSES AND THE W GRADE

A student may, with the approval of the instructor (and adviser, if required), add a course to the study list before the end of the second week of instruction of a quarter.

A student may drop a course before the end of the ninth week of instruction by filing the appropriate form with the registrar, after first notifying the instructor and/or department.

A student who wishes to drop all courses is required to file an Undergraduate Request for Withdrawal form with the college academic advising or dean's office.

1. A course dropped before the end of the fourth week of instruction will not appear on the student's transcript.

   Note: Students who drop certain laboratory courses after the second scheduled meeting period will receive a W grade.

2. If a student drops a course after the end of the fourth week of instruction and before the end of the ninth week of instruction, the registrar will assign a final grade of W to the student for that course.

3. A student may not drop a course after the end of the ninth week of instruction.

When an instructor has assigned a grade in a course in accordance with the Academic Senate policy on Integrity of Scholarship prior to the end of the ninth week of instruction, that grade may not subsequently be changed by dropping the course or withdrawing from the university.

WITHDRAWING FROM SCHOOL AND THE W GRADE

A student may withdraw from the university before the end of the ninth week of instruction of a quarter.

1. If a student withdraws before the end of the fourth week of instruction, no course entries will appear on the student's transcript for that quarter.

   Note: Students who drop certain laboratory courses after the second scheduled meeting period will receive a W grade.

2. If a student withdraws after the end of the fourth week of instruction and before the end of the ninth week of instruction, the registrar will assign a final grade of W to the student for each course in which the student was enrolled at the beginning of the fifth week of instruction.
3. Each student will receive a final grade for each course in which the student was enrolled at the end of the ninth week of instruction of the quarter.

When an instructor has assigned a grade in a course in accordance with the Academic Senate policy on Integrity of Scholarship prior to the end of the ninth week of instruction, that grade may not subsequently be changed by dropping the course or withdrawing from the university.

The In Progress (IP) Grade

For exceptional and compelling reasons, a course extending over more than one quarter may be authorized with the prior approval of the Committee on Educational Policy and Courses (for undergraduate courses) or the Graduate Council (for graduate courses). In such courses an evaluation of a student's performance may not be possible until the end of the final term. In such cases the instructor may assign the provisional grade IP (in progress).

IP grades shall be replaced by final grades if the student completes the full sequence. The instructor may assign final grades, grade points, and unit credit for completed terms when the student has not completed the entire sequence provided that the instructor has a basis for assigning the grades and certifies that the course was not completed for good cause. An IP not replaced by a final grade will remain on the student's record.

In calculating a student's grade-point average, grade points and units for courses graded IP shall not be counted. However, at graduation, courses still on the record as graded IP must be treated as courses attempted in computation of the student's grade-point average in assessing a student's satisfaction of Senate Regulation 634.

The Incomplete (I) Grade

Academic Senate regulations state that the Incomplete grade I for undergraduates shall be disregarded in determining a student's grade-point average, except at point of graduation, when students must have an overall 2.0 (C) on all work attempted at the University of California. All work required for a degree must be completed by the end of the quarter the student filed for graduation. Students requesting an I grade the last quarter before graduation may have their graduation date delayed.

Undergraduate students whose work is of non-failing quality but incomplete for good cause, such as illness, must file a Request to Receive/Remove Grade Incomplete form.

Graduate students enrolled in graduate courses may request instructors to assign the grade of "Incomplete" in order to be permitted to complete required work within the following quarter. If the required work is not submitted by the end of the quarter following so that the grade can be reported by the instructor, the grade will automatically be changed to one of "Failure" by the registrar. Graduate students must file a Request to Receive/Remove Grade Incomplete form.

1. Students should complete their portion of the request form, including the reason they are requesting the Incomplete, and provide appropriate documentation to support their request (e.g. doctor's note). The deadline for filing an Incomplete shall be no later than the first working day after final examination week.
2. The instructor has the option to approve or disapprove the request and should state on the form *how* and *when* the I is to be completed. If approved, the instructor submits the form with term grade reports.
3. Students must complete the work to remove the Incomplete on or before the date agreed upon with the instructor and in time for the instructor to assign a grade **before the end of finals week the following quarter.**
4. Failure to complete this work within the regulation time limit will result in the Incomplete lapsing to a *permanent* F, NP, or U grade.

A student who has received an I grade should not re-enroll in the course to make up the missing work. If the student were to re-enroll, the course would be considered a repeat and would not remove the prior quarter's Incomplete, which would lapse to a permanent F, NP, or U grade.

INTENDED USE OF THE INCOMPLETE

The Incomplete is intended for use when circumstances *beyond a student's control* prohibit taking the final exam or completing course work.

The Incomplete is *not* intended as a mechanism for allowing a student to retake a course. A student who has fallen substantially behind and needs to repeat a course can drop the course prior to the end of the ninth week of classes. Otherwise, the instructor should assign the appropriate final grade (D, F, NP, or U, for example).

An Incomplete may not be used simply to allow a bit more time for an undergraduate student who has fallen behind for no good reason. An I may be granted *only* to students who have a legitimate excuse. Examples of unacceptable reasons for approving an Incomplete include the need to rewrite a paper; the demands of a time-consuming job; the desire to leave town for a vacation, family gathering, or athletic contest; the desire to do well on GRE tests; and the like.

EXTENSION OF INCOMPLETE

For justifiable reasons, such as illness, students can petition to extend the Incomplete past one quarter. Petitions to extend the Incomplete must be submitted to the Academic Senate or the dean of OGSR (for graduate students), and must have the prior approval of the instructor and the department chair. Requests for extensions must be submitted before the Incomplete grade lapses to an F, NP, U grade. The extension cannot be made retroactively.

An I grade may be replaced upon completion of the work required by a date agreed upon with

the instructor, but no later than the last day of finals week in the following quarter. If not replaced by this date, the I grade will lapse into an F, NP, or U grade, depending upon the student's initial grading option.

Student Copy of Final Grades

At the end of each quarter students should check StudentLink for grade information. Grades are usually available ten working days after the end of final examinations. Students should examine their record for accuracy and report any omissions or errors to the Office of the Registrar immediately.

Transcript Requests

Application for an official transcript of record to be sent to another party or institution should be submitted to the registrar several days in advance of the time needed. An application for a transcript must bear the student's signature. A $6 fee is charged per copy. Checks should be made payable to the Regents of the University of California.

Grade Appeals

A. 1. If a student believes that nonacademic criteria have been used in determining his or her grade in a course, he or she may follow the procedures described in this regulation.

2. *Nonacademic criteria* means criteria not directly reflective of academic performance in this course. It includes discrimination on political grounds or for reasons of race, religion, sex, or ethnic origin.

3. Appeals to this committee [see (B)(4)] shall be considered confidential unless both the complainant and the instructor agree otherwise. They may agree to allow the student representatives to the committee to participate in the deliberations of the committee, or they may agree to open the deliberations to members of the university community.

B. 1. The student may attempt to resolve the grievance with the instructor within the first month of the following regular academic quarter.

2. If the grievance is not resolved to the student's satisfaction, he or she may then attempt to resolve the grievance through written appeal to the department chair or equivalent, who shall attempt to adjudicate the case with the instructor and the student within two weeks.

3. If the grievance still is not resolved to the student's satisfaction, he or she may then attempt to resolve the grievance through written appeal to the provost of the college, the dean of Graduate Studies, or the dean of the School of Medicine, who shall attempt to adjudicate the case with the instructor, the chair, and the student within two weeks.

4. If the grievance is not resolved to the student's satisfaction by the provost or dean, the student may request consideration of the appeal by the CEP Subcommittee on Grade Appeals (hereinafter called the Committee) according to the procedures outlined below. This request must be submitted before the last day of instruction of the quarter following the quarter in which the course was taken.

C. 1. The student's request for Committee consideration should include a written brief stating the nature of the grievance, including copies of any and all documents in his or her possession supporting the grievance. The submission of the brief to the Committee places the case before it and restricts any change of the challenged grade to a change initiated by the Committee, unless the Committee determines that all other avenues of adjudication have not been exhausted.

2. Upon receipt of the student's request, the Committee immediately forwards a copy of it to the instructor involved and asks the instructor, the department chair or equivalent, and the provost or dean for written reports of their attempts to resolve the complaint.

3. The Committee, after having determined that all other avenues of adjudication have been exhausted, shall review the brief and the reports to determine if there is substantial evidence that nonacademic criteria were used.

a. If the Committee finds substantial evidence that nonacademic criteria were used, it shall follow the procedure in paragraph (D) below.

b. If the Committee decides the allegations are without substance, it shall serve written notification of its findings to the complainant and to the instructor within two weeks. Within ten days the complainant or the instructor may respond to the findings and any member of the Committee may appeal the Committee's findings to the full Committee on Educational Policy and Courses. If there are no responses, or if after consideration of such responses the Committee sustains its decision, the grade shall not be changed.

D. 1. If the Committee determines that there is evidence that nonacademic criteria were used, it shall interview any individual whose testimony might facilitate resolution of the case. The complainant shall make available to the Committee all of his or her work in the course which has been graded and is in his or her possession. The instructor shall make available to the Committee all records of student performance in the course and graded student work in the course which is still in his or her possession. The complainant and the instructor shall be interviewed. At the conclusion of the case each document shall be returned to the source from which it was obtained.

2. The Committee shall complete its deliberations and arrive at a decision within two weeks of its determination that evidence of the use of nonacademic criteria had been submitted. A record of the Committee's actions in the case shall be kept in the Senate Office for three years.

3. If the allegations of the complainant are not upheld by a preponderance of the evidence, the Committee shall so notify the complainant and the instructor in writing. Within one week of such notification, the complainant and the instructor shall have the opportunity to respond to the findings and the decision of the Committee. If there are no responses, or if after considering such responses the Committee sustains its decision, it shall so notify the complainant and the instructor in writing and the grade shall not be changed.

4. If the Committee determines that nonacademic criteria were significant factors in

establishing the grade, it shall give the student the option of either receiving a grade of P or S in the course or retroactively dropping the course without penalty. A grade of P or S awarded in this way shall be acceptable towards satisfaction of any degree requirement, even if a minimum letter grade in the course had been required, and shall not be counted in the number of courses a student may take on a P/NP basis. If the student elects to receive a grade of P or S, the student may also elect to have a notation entered on his or her transcript indicating that the grade was awarded by the divisional grade appeals committee.

a. The Committee shall serve written notification of its finding and its decision to the complainant and the instructor. The complainant and the instructor may respond in writing to the findings and the decision of the Committee within one week of such notification.

b. If there are no responses, or if after considering such responses the Committee sustains its decision, the grade shall be changed; the Committee shall then instruct the registrar to change the grade to P or S or, if the student elected the drop option, to retroactively drop the course from the student's record. Copies of the Committee's instruction shall be sent to the complainant and the instructor.

E. These procedures are designed solely to determine whether nonacademic criteria have been used in assigning a grade, and if so to effect a change of that grade.

1. No punitive actions may be taken against the instructor solely on the basis of these procedures. Neither the filing of charges nor the final disposition of the case shall, under any circumstances, become a part of the personnel file of the instructor. The use of nonacademic criteria in assigning a grade is a violation of the Faculty Code of Conduct. Sanctions against an instructor for violation of the Faculty Code may be sought by filing a complaint in accordance with San Diego Division By-Law 230(D). A complaint may be filed by the student or by others.

2. No punitive actions may be taken against the complainant solely on the basis of these procedures. Neither the filing of charges nor the final disposition of the case shall, under any circumstances, become a part of the complainant's file. The instructor may, if he or she feels that his or her record has been impugned by false or unfounded charges, file charges against the complainant through the office of the vice chancellor for Student Affairs, the dean of Graduate Studies, or the associate dean for Student Affairs of the School of Medicine.

UCSD Policy on Integrity of Scholarship

Integrity of scholarship is essential for an academic community. The university expects that both faculty and students will honor this principle and in so doing protect the validity of university intellectual work. For students, this means that all academic work will be done by the individual to whom it is assigned, without unauthorized aid of any kind. Instructors, for their part, will exercise care in planning and supervising academic work, so that honest effort will be upheld.

The following policies apply to academic course work for both undergraduate and graduate students. A separate policy exists governing integrity of research. Medical students are governed by policies specified in the *Handbook for School of Medicine Advisers and Students,* as formulated by the School of Medicine Committee on Educational Policy.

INSTRUCTORS' RESPONSIBILITY

At the beginning of the term the instructor shall state in writing (e.g., in the syllabus, information sheets, or Web site) what graded assignments and exams will be required of students. If there are any course-specific rules required by the instructor for maintaining academic integrity, the instructor shall also inform students in writing what kinds of aid and collaboration, if any, are permitted on graded assignments and exams. The UCSD Policy on Integrity of Scholar--ship states the general rules for student integrity.

STUDENTS' RESPONSIBILITY

Students are expected to complete the course in compliance with the instructor's standards. No student shall engage in any activity that involves attempting to receive a grade by means other than honest effort, for example:

No student shall knowingly procure, provide, or accept any unauthorized material that contains questions or answers to any examination or assignment to be given at a subsequent time.

No student shall complete, in part or in total, any examination or assignment for another person.

No student shall knowingly allow any examination or assignment to be completed, in part or in total, for himself or herself by another person.

No student shall plagiarize or copy the work of another person and submit it as his or her own work.

No student shall employ aids excluded by the instructor in undertaking course work.

No student shall alter graded class assignments or examinations and then resubmit them for regrading.

No student shall submit substantially the same material in more than one course without prior authorization.

A student acting in the capacity of an instructional assistant (IA), including but not limited to teaching assistants, readers, and tutors, has a special responsibility to safeguard the integrity of scholarship. In these roles the student functions as an apprentice instructor, under the tutelage of the responsible instructor. An IA shall equitably grade student work in the manner agreed upon with the course instructor. An IA shall not make any unauthorized material related to tests, exams, homeworks, etc. available to any student.

Responsibility for Disposition of Cases of Academic Dishonesty

The responsibility for maintaining the standards of academic honesty rests with two university authorities: the faculty and the administration.

Under the standing orders of the Regents, discipline is the exclusive responsibility of the campus administration, while authority over courses and curricula is delegated to the faculty through the Academic Senate. When a student has admitted to or has been found guilty of a violation of the standards of academic honesty, two separate actions shall follow.

(1) The instructor shall determine the student's grade on the assignment and in the course as a whole. Any breach of academic honesty may be considered grounds for failure in the course, although less serious consequences may be incurred in less serious circumstances.

(2) The appropriate administrative authority shall impose a disciplinary penalty. For undergraduates, the appropriate administrative authority is the Council of Deans of Student Affairs. For graduate students, the appropriate administrative authority is the assistant dean of Graduate Studies. Sanctions will be imposed in accordance with guidelines authorized by the Committee on Educational Policy.

Procedures for Disposition of Cases of Academic Dishonesty

The procedure for disposition of cases of academic dishonesty is divided into three phases (A. initial phase; B. decision and resolution phase; C. appeals phase):

A. The Initial Phase

When an instructor has reason to believe that a student has violated UCSD's Policy on Integrity of Scholarship, the instructor should proceed in one of two ways:

I. Call the student to a meeting to discuss the suspected violation. If the instructor decides that there is evidence of academic dishonesty, he or she must report the suspected violation to the Office of the Student Conduct Coordinator (SCC) in the Office of Student Policies and Judicial Affairs (SPJA).

II. Notify the SCC directly that there is a suspected violation of academic integrity.

Once the SCC has been notified by the instructor, the SCC shall notify the appropriate dean that a student is suspected of a violation of academic integrity and initiate record keeping to track the disposition of the case. For graduate students, the appropriate dean is the assistant dean of Graduate Studies. For an undergraduate student who is alleged to have acted alone or in concert with students from his or her own college, the appropriate dean is the dean of Student Affairs of the student's college. If students from more than one college are allegedly involved in the same incident, the SCC will direct the case to the chair of the Council of Deans of Student Affairs. The chair will then appoint one of the deans to proceed with the case for all students, regardless of college.

The dean shall contact the instructor and discuss the evidence in the case. If the instructor decides to proceed with the charges, the dean shall notify the student of the charges in writing and inform the student of the procedures for processing cases of academic dishonesty under the UCSD Policy on Integrity of Scholarship and where to obtain advice and assistance, such as from Student Legal Services. If the instructor is absent, the instructor's department chair or program director may represent the instructor.

B. The Decision and Resolution Phase

The student shall have ten (10) business days following notification by the dean to meet with the dean to discuss the charges and possible administrative penalties. The student shall then decide whether:

I. to accept the charge of academic dishonesty

II. to deny the charge of dishonesty and to proceed to a formal hearing

Consequences of each of these decisions are presented below. If the student fails to respond to the written notification of alleged misconduct and does not meet with the dean, he or she shall be presumed to have taken decision I.

Decision I *(Student accepts charge of academic dishonesty):* If an undergraduate makes decision I, the dean shall notify the SCC of the student's decision. The SCC shall notify the instructor and, if the course has been completed, request a grade assignment. The instructor shall assign a grade for the course and notify the SCC of the grade.

The dean shall also make a recommendation of any administrative penalty to the Council of Deans of Student Affairs. The Council of Deans of Student Affairs shall decide the administrative penalty and notify the SCC of the decision. Notification to the SCC of the administrative penalties should take no longer than 30 business days from the time the dean is notified by the SCC of the charge.

Within (10) ten business days of being notified by the Council of Deans of Student Affairs, the SCC shall notify the student, the dean, and the instructor of the administrative penalty. Once the course has been completed and the SCC has been notified of the grade by the instructor, the SCC will notify the student, the dean, and the Registrar of the grade.

If a graduate student makes decision I, the assistant dean of Graduate Studies shall decide the administrative penalty and the instructor shall decide the course grade. Both shall notify the SCC of their decisions. The SCC shall then notify the student, the dean, and the Registrar of the grade, and the instructor of the administrative penalty.

A record of the administrative penalty shall be maintained in the office of the appropriate dean, the Council of Deans, and the SCC. A statement of the final disposition of the case shall be sent by the SCC to the chairperson of the department or program in which the violation occurred.

Decision II *(Student denies charge and requests a formal hearing):* If the student denies having committed the alleged act of academic dishonesty (decision II), he or she must submit a written request for a formal hearing to the appropriate dean within ten (10) business days of being notified of the charges by the dean. The dean shall transmit the written request to the SCC. Within thirty (30) calendar days after receipt of the request, the SCC shall schedule a formal hearing of the case by the Academic Dishonesty Hearing Board ("Hearing Board"). The SCC shall provide at least ten (10) business days' notice to the student and the instructor of the time, date, and location of the hearing. The SCC shall be available to advise the instructor of the procedures and options for presentation of the case and, if the instructor so chooses, to present the case to the hearing board.

The Standing Hearing Board shall be composed of three faculty members appointed by the Academic Senate, one graduate

student appointed by the assistant dean of Graduate Studies, one upper-division undergraduate student appointed by the vice chancellor of Student Affairs, and a college dean, who shall serve as the presiding officer. Members shall normally serve a two-year term. The presiding officer shall conduct the hearing and advise the hearing board on procedure, but shall not vote. If the student is enrolled in the same college as the presiding dean, a dean from another college shall serve as the presiding officer.

The hearing board shall be governed by the general UCSD rules of procedural due process. When standing members are not available, the formal hearing may be conducted with alternates appointed from the appropriate panel as listed below. To proceed with the hearing, however, the hearing board must have three of the faculty members present, at least one of which must be a member of the standing board. The SCC shall select alternates to the hearing board from the following panels:

1. A panel of ten faculty members appointed by the Academic Senate Committee on Committees.

2. A panel of upper-division (junior or senior) undergraduate students, one from each college, to be appointed by the college dean. Members of this panel must have completed at least one year on a standing judicial board at UCSD.

3. A panel of five graduate students to be appointed by the assistant dean, OGSR.

The hearing board shall hold a formal hearing and decide on the basis of a preponderance of the evidence whether the student engaged in academic dishonesty. In cases in which the hearing board deems that expert advice is essential to its judgment, the hearing board, in consultation with the Committee on Committees, may appoint an ad hoc committee to advise it. The ad hoc committee shall consist of three faculty members with knowledge of the field in question. The members of the ad hoc committee shall be present at the hearing and shall advise the hearing board during the board's deliberations. The final judgment on the case shall rest with the hearing board. Within five (5) business days from the date on which the hearing is completed, the presiding officer shall forward the hearing board's findings to the appropriate dean, with copies to the SCC, department chairperson or program director, the instructor, and the accused student.

If the student is found guilty of academic dishonesty, the appropriate administrative authority (for undergraduate students the Council of Deans of Student Affairs; for graduate students the assistant dean of Graduate Studies) shall then decide the administrative penalty and shall inform the student in writing within ten (10) business days after receipt of the notice of the hearing board's final judgment. They shall also notify the instructor, the SCC, and the department chair or program director. The instructor shall then assign a grade for the course and notify the SCC of the grade within ten (10) business days. The SCC shall notify the student, the dean, and the Registrar of the grade.

If the hearing board finds the evidence insufficient to sustain the charge of academic dishonesty, the administrative authority and the instructor shall dismiss the matter without further action against the student, who shall be permitted either to complete the course without prejudice or to withdraw from it. The student shall notify the SCC of his or her decision, and the SCC shall notify the Registrar of the student's decision. If the student withdraws from the course, it shall not be listed on his or her transcript.

C. **The Appeals Phase: (Section I describes the appeal of the judgment of the hearing board, and Section II describes appeals of the academic action, administrative penalty, or both.)**

I. **Appeal of the Judgment of the Hearing Board:** If the hearing board sustains the charge of academic dishonesty, an undergraduate student may appeal the judgment by writing to the Council of Provosts. Appeals must be made within five (5) business days of formal notification of the final disposition of the case. The Council of Provosts will consider the appeal within ten (10) business days from the date of appeal.

A graduate student or IA may submit an appeal to the dean of Graduate Studies.

The basis for appeal of the hearing board's judgment shall be: (i) that the standards of procedural fairness were violated, e.g. that the student did not have sufficient opportunity to present his or her side of the case; or (ii) that there exists newly discovered important evidence that has substantial bearing on the findings of the hearing board. If the appeal is sustained, the case shall be referred back to the hearing board for a new hearing. Except for such appeals, the judgment of the hearing board shall be final.

II. **Appeal of the Academic Action, Administrative Penalty, or both:** Within five (5) business days of receipt of the SCC's notification, the student may appeal the instructor's grade assignment, or the administrative officer's administrative penalty, or both, by submitting a written request as provided below:

Request for Modification of Academic Action: A request for review of the grade assignment may be directed to the CEP Subcommittee on Grade Appeals. If the case has been heard by the hearing board, the CEP Subcommittee on Grade Appeals shall receive the report of the hearing board and accept its findings as to the facts of the case.

Request for Reduction of Administrative Penalty: An appeal of the appropriate authority's administrative penalty under the provisions of paragraphs A or C shall be directed by an undergraduate student to Council of Provosts. The Council of Provosts will evaluate the student's appeal and make a final decision within ten (10) business days of receiving the appeal. An appeal by a graduate student shall be directed to the dean of Graduate Studies.

Policies for Student Records and Timeline Extensions

Once an instructor has decided to proceed with a charge of academic dishonesty, he or she will refrain from assigning a course grade for the student until the charge has been resolved. If the

course concludes before the charge is resolved, the instructor will assign an "IP" on the course grade sheet for the student's grade and will indicate in the memorandum column that this IP is for a "Pending Charge of Academic Dishonesty." Academic Records will note in attached text to the course (i.e., not on the student's transcript) that the hold is for a "Pending Charge of Academic Dishonesty." The student's transcript will show an "IP" for the course until the charge is resolved. While a hold is in effect, the student shall not drop the course. The faculty hold shall not be removed by the Registrar until notification from the SCC, who shall release the hold once the charge is resolved and a grade has been assigned by the instructor. If a passing grade is assigned and a conflict arises with a duplicate, cross-listed, or equivalent course taken after the charge has been recorded, the SCC will direct the Registrar to drop the student from the duplicate course or remove the grade for the duplicate course from the student's record.

If the student accepts the charge of academic dishonesty or is found guilty by the hearing board, the grade assigned by the instructor will be counted in the student's GPA even if the course is retaken. Academic Records will permanently note in text attached to the course (i.e., not on the student's transcript) that the grade was given as a result of "Academic Dishonesty."

If the student withdraws from UCSD before the final disposition of the case, the following policy shall govern. If the student is found to have committed an act of academic dishonesty, and the instructor assigns him or her a final grade in the course, this grade shall be permanently entered on the transcript. If the administrative penalty is dismissal, the transcript shall bear a notation that readmission is contingent upon the approval from the chancellor. Any administrative penalty less severe than dismissal shall be imposed when the student returns to the university.

If a case of suspected academic dishonesty is also the subject of an administrative inquiry under the Policy on Integrity of Research, then the senior vice chancellor for Academic Affairs, in consultation with the hearing board, may make such modifications in procedure as are necessary to coordinate the two inquiries.

If the final decision in the case results in dismissal of the student, a record of the case and its outcome shall be established in the office of either the vice chancellor for Student Affairs or the dean of Graduate Studies, depending on the registration status of the student. If the administrative penalty is suspension or dismissal, the fact that the student was suspended or dismissed for academic dishonesty must be posted on the academic transcript for the duration of the penalty.

The director of SPJA may extend any timelines in this policy when practical exigencies so dictate. If a delay is imposed, the affected individuals will be notified.

Reporting, Record Keeping, and Review of this Policy

The SCC shall report annually to the Academic Senate Committee on Educational Policy, the Council of Provosts, and the vice chancellor for Student Affairs on the number and character of misconduct, the pattern of decision-making (contested or uncontested), the severity of sanctions, both administrative and academic, and other relevant matters as decided by the Committee on Educational Policy.

Special Programs

Education Abroad Program and the Opportunities Abroad Program

Please refer to the "Courses, Curricula, and Programs of Instruction" section of this catalog, where the Education Abroad Program and the Opportunities Abroad Program are described in full.

Intercampus Transfer (ICT)

An undergraduate in good academic standing who is now, or was previously, registered in a regular session at any campus of the University of California and has not since registered at any other institution may apply for admission as a transfer in the same status to another campus of the university.

HOW TO APPLY

Intercampus transfers must complete the University of California Undergraduate Application form. These forms are available in the Office of the Admissions. You may apply to one or to as many as eight UC campuses of the university using one application form. Send your completed application to:

University of California
Admissions Application Processing Service
P.O. Box 23460
Oakland, CA 94623-0460

Mail only your application form, fees, and essay to the processing service address above. Send your transcripts, test scores, and all other correspondence relating to your application directly to the Admissions Office at the university campus(es) to which you apply. The processing service will not forward them.

You may apply online using Pathways: www.ucop.edu/pathways.

APPLICATION FEES

The basic application fee of $40 entitles you to apply to one university campus. If you apply to more than one campus, you must pay an additional $40 for each campus you select. These fees are not refundable.

WHEN TO APPLY

Priority dates for filing applications for intercampus transfer are identical to the application filing dates for new students: fall, November 1–30; winter, July 1–31; and spring, October 1–31. UC Berkeley fall semester, November 1–30.

A campus will accept applications after the priority period only if it still has openings. If you apply after the priority filing period to a campus that is no longer accepting applications, the Admissions Application Processing Service will notify you by mail that your application will not be forwarded to that campus. In this case, you may receive a full or partial refund of the application fee.

Please note: UCSD does not accept applications for winter and spring quarters. Consult the application for undergraduate admission for information regarding other campuses.

Intercampus Visitor (ICV)

Qualified undergraduates may take advantage of educational opportunities on other campuses of the University of California as an Intercampus Visitor (ICV). This program is designed to enable qualified students to take courses not available on their home campus, to participate in special programs, or to study with distinguished faculty members on other campuses of the university. Students who meet the following requirements should complete an application available in the Office of the Registrar.

1. An undergraduate student must have completed at least one year in residence on the home campus and have maintained a grade-point average of at least 2.0 (or equivalent) to apply as an intercampus visitor.
2. Approval of the appropriate provost office is required.
3. Some UC campuses have additional requirements. See the application for requirements and deadlines.

If students meet the above conditions, they should complete the ICV application form and return it to the Office of the Registrar on the home campus, on or before the appropriate deadlines. The ICV application is subject to approval of both the home and host campuses.

A nonrefundable fee of $40 is charged for each ICV application.

Simultaneous Enrollment of UCSD Students at other UC Campuses

UCSD students may enroll in classes at another UC campus for the same term providing the student:

- Has completed one quarter as a matriculated student at UCSD
- Is enrolled and paid for a minimum of twelve units for the current term at UCSD and maintains this status
- Is in good standing
- Has the appropriate academic preparation as determined by the host campus.

Financial aid is available only through UCSD. Students eligible for veterans, rehabilitation, social security, and other federal, state, or county benefits must secure eligibility certification through the UCSD financial aid office. Units taken at both campuses may be combined to establish full-time enrollment for financial aid.

ROTC

UCSD does not have an ROTC program. Students may, however, with the permission of their college, enroll in ROTC courses at another institution in conjunction with completing their degree programs at UCSD.

ROTC courses are conducted on the campuses of the University of San Diego and San Diego State University (College of Extended Studies for the Navy ROTC, and at San Diego State University for Army and Air Force ROTC. Further information on these programs may be obtained from the ROTC adviser at the Aerospace Studies Department, (619) 594-5545, and the Military Science Department, (619) 594-4943, at San Diego State University, or the Department of Naval Science, (619) 260-4811, at the University of San Diego.

Absence/Readmission to the University

Undergraduate students absent for no more than one quarter are considered to be continuing students and should contact the Office of the Registrar for registration information.

Students in good academic standing who are absent for **two or more consecutive quarters** must file an application for readmission no later than four weeks prior to the beginning of the quarter at the Office of the Registrar, 301 University Center. A nonrefundable fee of $40 is charged.

Students in good academic standing who were absent for **three quarters or more**, must consult with a college academic adviser before enrollment to ensure adherence to graduation requirements.

Students who were on probation or subject to dismissal the last quarter of attendance at UCSD may be required to consult with an academic adviser prior to approval of the readmit application and establish a contract before enrollment.

Students who were dismissed from UCSD, but have subsequently met the conditions stipulated in their original dismissal letter, must consult with an academic adviser and establish a quarterly contract before readmission and enrollment.

Students who attended another institution since leaving UCSD must submit official transcripts for all academic work completed. This work must be of passing or higher quality.

In the case of major departments with approved screening criteria, students may be readmitted as pre-majors.

Withdrawal from the University

Enrolled or registered (paid fees) students who wish to withdraw either prior to or during the quarter are required to complete the Undergraduate Application for Withdrawal. The form should be filed with the student's college academic advising or dean's office. These forms serve two purposes: 1) a means to provide a refund of fees, if appropriate (see below); 2) automatic withdrawal from classes (see also "The W Grade"). Students considering withdrawing are urged to consult with their respective college. The colleges recognize that there are many reasons for students withdrawing from the university.

Refund Policy

NEW UNDERGRADUATE STUDENTS

Prior to the first day of instruction, the registration fee is refunded minus the $100 statement of intention to register fee.

REFUND SCHEDULE

The following schedule of refunds is effective beginning with the first day of instruction and refers to calendar days (including weekends):

0–1 days	2–7 days	8–18 days	19–35 days	36 days and over
100 percent	90 percent	50 percent	25 percent	0 percent

(Subject to Change)

The effective date of withdrawal used in determining the percentage of fees to be refunded is the date indicated on the withdrawal form by the college academic advising or dean's office.

RETURN OF TITLE IV FEDERAL STUDENT AID

Financial aid recipients may be required to return some or all of their aid at the time of withdrawal. This requirement applies only to undergraduate students who withdraw prior to completing 60 percent of the quarter. Questions about financial aid repayment should be directed to the Financial Aid Office.

Auditing

Interested individuals, including registered students, are permitted to audit courses only with the explicit and continuing consent of, and under such rules as may be established by, the faculty member in charge of the course. The instructor is not obligated to devote time to the work of individuals not officially enrolled in the course. All persons auditing are required to abide by University policies and campus regulations.

Graduate Studies

At the University of California, San Diego all programs leading to master's degrees and to doctoral degrees (other than the M.D.) are under the jurisdiction of the Graduate Council and are administered by the Office of Graduate Studies and Research.

The combined administrative responsibility for graduate studies and for research reflects the intention of the San Diego campus to emphasize the research character of graduate education. Doctoral and most master's degrees are the culmination of creative effort and attest to the ability of the recipient to continue original inquiry. In addition to requiring original research, most of UCSD's graduate programs expect their students to obtain teaching experience.

Much of the training UCSD offers takes place outside the classroom–not only in seminars but in independent research and in tutorial work. Students can benefit from the many visitors from other universities; there are opportunities to study at other campuses of the University of California; and many students become involved in the research activities of UCSD's research institutes and centers. La Jolla has become one of the most important intellectual centers of the West. Not only has UCSD attracted many of the world's great scholars, but other research institutions located nearby such as the Salk Institute for Biological Studies, the Burnham Institute, and The Scripps Research Institute have enhanced the area's reputation.

The Nature of Graduate Instruction

Graduate courses demand, on the part of both instructor and student, a capacity for critical analysis and a degree of research interest beyond those appropriate for undergraduate study. These courses generally carry a number in the 200 series and may be conducted in any of several ways: (1) as advanced lecture courses; (2) as seminars in which faculty and students present critical studies of selected problems within the subject field; (3) as independent reading or study under faculty supervision; or (4) as research projects conducted under faculty supervision. Graduate courses numbered 400–499 are designed for professional programs and may not be used to satisfy minimum graduate course requirements for degrees other than the specific degree program for which they are offered. Courses at the upper-division level (100–197) may be taken in partial satisfaction of the requirements for an advanced degree.

Graduate students may take lower-division courses (1–99) for a letter grade, but grades earned in those courses will not be considered in their overall grade-point average (GPA) for the purpose of determining good standing, except for students in the M.P.I.A. program who may take lower-division language courses for a letter grade and for inclusion in their GPA for the purpose of determining good standing.

The graduate student is accorded considerable liberty in choice of courses as long as minimum departmental core course, departmental requirements and grading standards, and residency requirements are met.

Administration

The Office of Graduate Studies and Research

The Office of Graduate Studies and Research is administered by the dean of Graduate Studies, who is responsible for graduate admissions; graduate degree programs; the administration of fellowships, traineeships, and other graduate student support; the development of new programs; and the maintenance of common standards of high quality in graduate programs across the campus.

The dean reports to the senior vice chancellor of Academic Affairs and to the Graduate Council, on the administration of graduate affairs.

The Graduate Council

The Graduate Council is a standing committee of the San Diego Division of the Academic Senate composed of faculty and graduate students. The primary function of the council is to exercise overall responsibility for graduate study programs and to implement systemwide policies, procedures, requirements, and standards.

The Graduate Adviser

The graduate adviser in a department, group, or school is the faculty member to whom graduate students direct requests for information about graduate study in a particular program.

The graduate adviser's duties include:

1. Advising the dean on admission of graduate students.
2. Advising graduate students regarding their programs of study and other matters pertinent to graduate work.
3. Appointing individual advisers for each graduate student.
4. Approving official study lists.
5. Acting on the petitions of graduate students.
6. Insuring that adequate records are maintained on all graduate students in the department, group, or school, and supplying relevant information as requested by the dean.
7. Assisting the dean of Graduate Studies in the application of university regulations governing graduate students, graduate study, and graduate courses.
8. Advising the chair of the department and the dean of Graduate Studies about developments of the graduate program in the department, group, or school.

Graduate Student Association

The Graduate Student Association (GSA) is the officially recognized graduate student government at UCSD. It represents all graduate and medical students—including those at Scripps Institution of Oceanography, the Graduate School of International Relations and Pacific Studies, Rady School of Management, the School of Medicine, and the School of Pharmacy and Pharmaceutical Sciences—in academic, administrative, campus, and university matters. The GSA Council, composed of six executive officers and representatives from each department, group and school, nominates graduate student representatives for appointment to campus governing bodies and committees, including the Graduate Council, the Registration Fee Committee, and the systemwide Student Body Presidents' Council.

The GSA also sponsors projects and social activities designed to improve the academic and social lives of students. Meetings are open to all graduate and School of Medicine students.

For more information contact the GSA at (858) 534-6504.

Graduate Student Diversity

The University of California, San Diego actively recruits and admits qualified students to graduate programs who will enhance the diversity of UCSD graduate programs.

UCSD recognizes the value to students, faculty, staff, and the community in having a campus which reflects the full richness and talents of the people of California. Diversity is viewed as a campus strength and a critical component of higher education. The campus has a firm commitment to recruit and admit graduate students from all demographic groups including students from traditionally underrepresented backgrounds.

The Graduate Student Affairs Unit in the Office of Graduate Studies and Research provides an array of counseling and advocacy services to assist U.S. citizens and permanent residents in applying to graduate school, obtaining financial support, and successfully completing graduate degree programs.

UCSD offers the San Diego Fellowship Program, which is designed to increase campus diversity. The fellowship provides two awards: The San Diego Fellowship and the Eugene Cota-Robles Fellowship. Incoming students who have overcome significant economic, educational, or social hardship in pursuit of their education or whose presence would enhance campus or departmental diversity in other ways are eligible for awards through the San Diego Fellowship Program. Refer to the Fellowship and Traineeship section for more details.

In addition, a limited number of graduate student research awards are available in specific science disciplines through the UCSD-NIH Scholars program and The National Science Foundation Minority Access to Science, Engineering and Math (MASEM) Fellowship.

For assistance and further information about special opportunities for underrepresented students, contact the assistant dean, Office of Graduate Studies and Research, 518 University Center, (858) 534-3555 or (858) 534-3678.

For additional information on students with disabilities, see "Disabled Student Services" (page 97).

Career Services for Graduate Students

The Career Services Center offers a wide range of programs and services to assist graduate students with their career planning and job search needs. Individual career counseling is available on both an appointment and drop-in basis. In addition, workshops and special events are regularly offered covering such areas as resume writing, job search strategies, and nonacademic employment options. The Career Services Center houses a career reference library containing information on employers, job listings, alumni contact list, salaries, sample resumes, and publications pertinent to graduate students' career issues. An online database and Internet access computer lab is also available to assist in placement efforts. For more information, see the "Career Services" section of this catalog or visit the Career Services Office.

General Requirements for Higher Degrees

Courses and Grades

Only upper-division and graduate courses in which a student is assigned grades A, B, C (including plus [+] or minus [–]), D, or S are counted in satisfaction of the requirements for doctoral and master's degrees, the master of fine arts, master of Pacific international affairs, master of arts, master of engineering, master of science, doctor of musical arts, and doctor of philosophy degrees. An Incomplete grade, as well as an NR, will automatically lapse to an F or U if it has not been removed when the final report for the degree is approved by the Office of Graduate Studies and Research. (See also "Grades.")

Undergraduate language courses and courses in the 400 series are only used for degree credit in the program for the M.P.I.A. degree offered by the Graduate School of International Relations and Pacific Studies. For course information see the section on "International Relations and Pacific Studies" elsewhere in this catalog.

Registration in the Final Quarter for the Award of the Degree

A student completing course work, using university facilities including the library, or making any demands upon faculty time (other than final reading of the thesis or dissertation, or administering the comprehensive or doctoral examination), must register in the final quarter in which the degree is to be conferred. Students who need only to submit their theses or dissertations, or to take the comprehensive or final examination may pay a filing fee in lieu of registration in the final quarter (see "Filing Fee").

Master Degrees

Master of Advanced Study (M.A.S.)

The University of California offers graduate professional degree programs leading to the Master of Advanced Study (M.A.S.) degree. This degree meets the needs of working professionals continuing in educational programs. While some M.A.S. programs are tailored to career advancement, other programs enable individuals to pursue new career directions or advanced study in the liberal arts. Each M.A.S. program accommodates flexible, part-time, academically qualified working adults who cannot be full-time students. All M.A.S. degree programs must be in conformity with one of the following two plans: Plan I. Thesis Plan or Plan II. Comprehensive Examination Plan. Pending program approval, an alternative capstone plan is a third option. Specific degree requirements, curriculum, and other details are available with each individual program.

Master of Arts (M.A.) and Master of Science (M.S.)

The master of arts and master of science degrees are offered under two plans: Plan I, Thesis, and Plan II, Comprehensive Examination. Since some departments offer both plans, with varying unit requirements, students should consult with their advisers before selecting a plan for completion of degree requirements.

Master of Business Administration (MBA)

The MBA is a professional degree that provides distinguished education in the theory and practice of management. The program provides a comprehensive education in the fundamental disciplines of business coupled with a focus on the business and management issues faced by technology and innovation driven companies.

Students interested in becoming managers and leaders in such companies and in understanding the role that technologies play in driving the global business marketplaces will be well suited for the Rady School of Management. For degree requirements and curriculum, please refer to the school.

Master of Education (M.Ed.)

The Teacher Education Program offers a Master of Education (M.Ed.)/Multiple Subject Credential to authorize teaching grades K–6, and a Masters of Education (M.Ed.)/Single Subject Credential for teaching 7–12 grades is offered in the subject areas of biology, chemistry, geoscience, English, mathematics, and physics. Degree requirements, curriculum, and other details regarding the program may be obtained from the Teacher Education Program.

Master of Engineering (M.Eng.)

Several departments in the School of Engineering offer the Master of Engineering (M.Eng.). The M.Eng. is a terminal degree designed to address the technical needs of engineers. Degree requirements, curriculum, and other details regarding the program may be obtained from the Department of Electrical and Computer Engineering and the Department of Bioengineering.

Master of Fine Arts (M.F.A.)

The Master of Fine Arts degree is offered in the Departments of Theatre and Dance, and Visual Arts under a modified thesis plan. A short written thesis that may be regarded as a position paper, presenting a descriptive background for the student's work, is required. There is no written final examination, but great weight is given to the candidate's final presentation and the oral defense of the thesis.

Master of Pacific International Affairs (M.P.I.A.)

The Master of Pacific International Affairs program provides training for those interested in pursuing professional careers in international affairs and international management with an emphasis on the countries of the Pacific Rim. For degree requirements and curriculum, please refer to the International Relations and Pacific Studies description under the catalog listings of programs of instruction.

Programs of Study

PLAN I: THESIS PLAN

A minimum of at least thirty-six quarter-units are required: eighteen units in graduate courses, including a minimum of twelve units in graduate-level courses in the major field; twelve additional units in graduate or upper-division courses; and six units in research course work leading to the thesis. Consult your department for specific unit and course requirements.

Following advancement to candidacy, the student electing Plan I must submit a thesis. The thesis committee, appointed by the chair of the department or group and approved by the dean of Graduate Studies, consists of at least three faculty members, with at least two from the candidate's major department.

Information covering thesis preparation is contained in the publication, *Instructions for the Preparation and Submission of Doctoral Dissertations and Masters' Theses*, which is mailed to students electing Plan I, upon their advancement to candidacy. The completed thesis is submitted to the thesis committee for review.

When all members of the committee have approved the thesis, a Final Report of the Thesis for the Master of Arts or Master of Science Degree under Plan I must be completed. The candidate submits the thesis to the Office of Graduate Studies and Research and upon approval by the dean of Graduate Studies, files the thesis with the university archivist who accepts it on behalf of the Graduate Council. Acceptance of the thesis by the archivist with a subsequent second approval by the dean of Graduate Studies represents the final step in the completion of all requirements by the candidate for a master of arts or master of science degree on the San Diego campus.

PLAN II: COMPREHENSIVE EXAMINATION PLAN

A minimum of at least thirty-six quarter-units are required: twenty-four units in graduate courses, including a minimum of fourteen units in graduate-level courses in the major field; and twelve additional units in graduate or upper-division courses. Consult your department for specific unit and course requirements.

Apprentice Teaching

A maximum of six units of 500-level courses (apprentice teaching) may be credited toward the degree requirements.

Academic Residence

The minimum residence requirement is three academic quarters, at least one of which must follow advancement to candidacy. Academic residence is met by satisfactory completion of six units or more per quarter, some of which must be graduate level.

A candidate must be registered in the quarter in which the degree is to be awarded. (See "Registration in the Final Quarter for the Award of the Degree.")

Advancement to Candidacy

After completing all preliminary requirements of the major with a GPA equivalent to 3.0 in upper-division and graduate course work undertaken, a total of no more than eight units of F and/or U grades, and a minimum of two quarters or more of residency, the student may file an Application for Candidacy for the Thesis or Comprehensive Examination, Plan I or II, for the Master of Arts or Master of Science Degree. An Application for Candidacy must be filed no later than two weeks after the first day of the quarter in which degree requirements are to be completed. (See "Academic Calendar.")

Following advancement to candidacy, the student electing Plan II must pass a comprehensive examination administered by the major department. A Final Report of the Comprehensive Examination for the Master of Arts or Master of Science Degree under Plan II is used to report successful completion of the examination requirement.

Transferring Credit

With the approval of the major department and the dean of Graduate Studies, upper-division and graduate course work completed with a grade of B– or better while in graduate standing at another campus of the University of California may be accepted in satisfaction of one of the three quarters of residence and up to one-half of the quarter-units of credit required for the master's degree at UCSD.

On the recommendation of the major department and with the approval of the dean of Graduate Studies, a maximum of eight quarter-units

GRADUATE DEGREES OFFERED: 2004–2005

Anthropology	Ph.D.
Art History, Theory, and Criticism	Ph.D.
Audiology	Au.D.
(Joint with San Diego State University)	
Bioengineering	M.S., Ph.D., M.Eng.
(Bioinformatics)	Ph.D.
Bioinformatics	Ph.D.
Biology	M.S., Ph.D.
(Bioinformatics)	Ph.D.
Biology	Ph.D.
(Joint with San Diego State University)	
Biomedical Sciences	Ph.D.*
(Bioinformatics)	Ph.D.
Business	MBA
Chemistry	M.S.**, Ph.D.
(Bioinformatics)	Ph.D.
Chemistry	Ph.D.
(Joint with San Diego State University)	
Clinical Psychology	Ph.D.
(Joint with San Diego State University)	
Clinical Research	M.A.S.
Cognitive Science	Ph.D.*
Communication	Ph.D.*
Comparative Studies in	
Language, Society, and Culture	Ph.D.§
Computer Science	M.S., Ph.D.
(Bioinformatics)	Ph.D.
(Computer Engineering)	M.S., Ph.D.
Earth Sciences	M.S.**, Ph.D.*
Economics	Ph.D.*
Economics and International Affairs	Ph.D.
Education	M.Ed., Ed.D.
(Joint with San Diego State University and California State University San Marcos)	Ed.D.***
Electrical Engineering	M.Eng.
(Applied Ocean Science)	Ph.D.*
(Applied Physics)	Ph.D.*
(Communication Theory and Systems)	Ph.D.*
(Computer Engineering)	Ph.D.*
(Electronic Circuits and Systems)	Ph.D.*
(Intelligence Systems, Robotics, and Control)	Ph.D.*
(Photonics)	Ph.D.*
(Signal and Image Processing)	Ph.D.*
Engineering Sciences	
(Aerospace Engineering)	M.S., Ph.D.
(Applied Mechanics)	M.S., Ph.D.
(Applied Ocean Science)	M.S., Ph.D.
(Chemical Engineering)	M.S., Ph.D.
(Engineering Physics)	M.S., Ph.D.
(Mechanical Engineering)	M.S., Ph.D.
Engineering Sciences (Applied Mechanics)	
(Joint with San Diego State University)	Ph.D.
Ethnic Studies	Ph.D.*
History	M.A., Ph.D.
(Judaic Studies)	M.A.
International Affairs	
Pacific International Affairs	M.P.I.A.
Economics and International Affairs	Ph.D.
Political Science and International Affairs	Ph.D.
Language and Communicative Disorders	
(Joint with San Diego State University)	Ph.D.
Latin American Studies	M.A.
Leadership of Healthcare Organizations	M.A.S.
Linguistics	Ph.D.*
Literature	Ph.D.
Comparative	M.A.
English and American	M.A.
French	M.A.
German	M.A.
Spanish	M.A.
Marine Biodiversity and Conservation	M.A.S.
Marine Biology	Ph.D.*
Materials Science	M.S., Ph.D.
Mathematics	M.A., Ph.D.
(Bioinformatics)	Ph.D.
Mathematics (Applied)	M.A.
Statistics	M.S.
Mathematics and Science Education	
(Joint with San Diego State University)	Ph.D.
Molecular Pathology	Ph.D.
Music	M.A., Ph.D., D.M.A.
Neurosciences	Ph.D.*
Oceanography	Ph.D.*
Philosophy	Ph.D.*
Physics	M.S.**, Ph.D.
(Bioinformatics)	Ph.D.
(Biophysics)	Ph.D.
Political Science	Ph.D.*
Political Science and International Affairs	Ph.D.
Psychology	M.A**, Ph.D.*
Public Health (Epidemiology) (Health Behavior)	
(Joint with San Diego State University)	Ph.D.
Sociology	Ph.D.*
Structural Engineering	M.S., Ph.D.
Teaching and Learning	
(Curriculum Design)	M.A.
(American Sign Language)	M.A.
Theatre	M.F.A.
(Joint with University of California, Irvine)	Ph.D.
Visual Arts	M.F.A.

*The master's degree may be awarded to students pursuing work toward the Ph.D. after fulfillment of the appropriate requirements. See appropriate section of catalog.

§ Students who have completed some graduate study at UCSD and have been admitted to a doctoral program may apply for this interdisciplinary program.

**UCSD undergraduates in the junior or senior year may apply to their respective departments for admission to the integrated B.S./M.S. degree program. A similar program is available to UCSD undergraduates in several of the engineering and science specialties. Consult department personnel and/or catalog departmental listing for complete information.

*** Pending approval.

of credit for work completed with a grade of B– or better in graduate standing at an institution other than the University of California may be applied toward a master's degree at UCSD. Courses used must be taken prior to matriculation at UCSD.

In any case, no more than a total of one-half of the units required for a master's degree may be transferred in from any UC or other institutions. Courses used for a previous degree may not be transferred. A letter from the institution from which the courses are being transferred will be required stating the courses were not used toward another degree.

Course work approved for transfer credit will not be included in calculating a student's grade-point average, regardless of the source.

Program of Study

PLAN III: MODIFIED THESIS PROGRAM

Seventy-two quarter-units for visual arts and ninety quarter-units for theatre, with a GPA equivalent to 3.0 in upper-division and graduate course work undertaken, are required for a Master of Fine Arts degree. Information covering thesis preparation is contained in the publication, *Instructions for the Preparation and Submission of Doctoral Dissertations and Masters' Theses*, which is mailed to students upon their advancement to candidacy. The completed thesis is submitted to the thesis committee for review.

Following the filing of an Application for Candidacy for the Modified Thesis, Plan III, the candidate must submit a thesis. The thesis committee, appointed by the chair of the department and approved by the dean of Graduate Studies, consists of four faculty members; three from the department and one, preferably tenured, from outside the department.

When all members of the committee have approved the thesis, a Final Report of the Modified Thesis Examination, Plan III, for the Master of Fine Arts degree must be completed. Approval by the dean of Graduate Studies and subsequent acceptance of the thesis by the university archivist, Special Collections, represents the final step in the completion of all requirements by the candidate for a Master of Fine Arts degree on the San Diego campus.

Academic Residence

The minimum residence requirement is six academic quarters for visual arts and eight academic quarters for theatre, at least one of which must follow advancement to candidacy in either program. Academic residence is met by satisfactory completion of six units or more per quarter, some of which must be graduate level. The entire residence requirement must be satisfied at UCSD.

A candidate must be registered in the quarter in which the degree is to be awarded. (See "Registration in the Final Quarter," page 78)

Advancement to Candidacy

After completing all preliminary requirements of the department with a GPA equivalent to 3.0 in upper-division and graduate course work undertaken, a total of no more than eight units of F and/ or U grades, and a minimum of five quarters of residency, the student may file an Application for Candidacy for the Modified Thesis, Plan III, for the Master of Fine Arts Degree. An application for candidacy must be filed no later than two weeks after the first day of the quarter in which degree requirements are to be completed. (See "Academic Calendar.")

Graduate Work Completed Elsewhere

In exceptional circumstances, a student may be given a leave of absence for the purpose of studying elsewhere. While appropriate credit may be allowed for course work completed elsewhere with a grade of B or better in a graduate program, the period involved will not reduce the UCSD academic residence requirement of six academic quarters for visual arts and eight quarters for theatre.

Doctoral Degrees

Doctor of Audiology (Au.D.)

The Au.D. is a professional doctoral degree offered jointly with San Diego State University (SDSU). The four-year degree program is designed for individuals who intend to specialize in clinical practice and to meet professional standards requiring a clinical doctorate as the entry-level degree for a certified audiologist. Graduates of this program will have the knowledge base, research exposure, and advanced clinical skills to enter the workforce in any setting, and be prepared to function as independent audiology professionals in the expanding health care arena. For degree requirements and curriculum, please refer to the Audiology section in the catalog.

Doctor of Education (Ed.D.)

The Ed.D. is a professional degree in which regional professional educators gain content knowledge as well as specific skills related to instructional leadership within the K–12 and postsecondary educational community. Advanced Ed.D. students will conduct research on professional practice within their own institution addressing specific local problems that have national implications for education. For degree requirements and curriculum, please refer to the Teacher Education Program section in this catalog.

Doctor of Musical Arts (D.M.A.)

The DMA degree emphasizes the dual preparation for professional careers in the performance of contemporary music, as well as in the equally demanding area of teaching these skills on an advanced level. Candidates for this degree are expected to demonstrate musical excellence, artistic maturity, and the capability for doing original scholarly work. For degree requirements and curriculum, please refer to the Department of Music description under the catalog listings of programs of instruction.

Doctor of Philosophy (Ph.D.)

The doctor of philosophy degree is a research oriented degree which requires individual study and specialization within a field or the establishment of connections among fields. It is not awarded solely for the fulfillment of technical requirements such as academic residence and course work. Candidates are recommended for the doctorate in recognition of having mastered in depth the subject matter of their discipline and having demonstrated the ability to make original contributions to knowledge in their field of study. More generally, the degree constitutes an affidavit of critical aptitude in scholarship, imaginative enterprise in research, and proficiency in communication, including—in most departments—practice in teaching.

Program of Study

The student's program of study is determined in consultation with the adviser who supervises the student's activities until the appointment of the doctoral committee. A doctoral program generally involves two stages.

The first stage requires at least three quarters of academic residence and is spent in fulfilling the requirements established by the Academic Senate and by the major department, group, or school. When the department considers the student ready to take the qualifying examination, it arranges for the appointment of a doctoral committee. Immediately upon passing the qualifying examination administered by the doctoral committee, the student advances to candidacy.

The second or in-candidacy stage is devoted primarily to independent study and research and to the preparation of the dissertation. A minimum interval of three quarters of academic residence must elapse between advancement to candidacy and the filing and final defense of the dissertation.

Foreign Language Requirements

Some doctoral programs require candidates to demonstrate language proficiency in one or more languages as part of the formal requirements for the Ph.D. degree. In these cases, the testing of proficiency is the responsibility of the department, group, or school concerned.

Doctoral Time Limits

All graduate students in doctoral programs are subject to campus policy on time limits to the Ph.D. Each graduate program has three time limits pertaining to students' academic progress toward the doctoral degree:

(1) the registered time by which a student must advance to doctoral candidacy; (2) the registered time during which a doctoral student is *eligible* for support; and (3) the registered time by which a student must complete all doctoral requirements. Students will not be permitted to continue in doctoral status beyond the pre-candidacy and total registered time limits. Students will not be permitted to receive UCSD-administered financial support beyond the support limit. Information about these time limits is given in the descriptions of each department's graduate program in this catalog and departmental publications.

University policy requires that graduate students be continuously registered—unless on an approved leave of absence—from the first quarter of enrollment to completion of degree requirements. (See "Continuous Registration" and "Leave of Absence.")

For purposes of calculating when precandidacy and total registered time limits are reached, accrued time is the elapsed time from first enrollment as a graduate student at UCSD less (a) time withdrawn or on approved leave of absence, and (b) time between completion of one graduate program at UCSD and first registration in another. For the support time limit, a maximum of three quarters of approved leave or withdrawal may be deducted from elapsed time in calculating accrued time. Time spent in graduate study at another institution or University of California campus prior to beginning graduate study at UCSD will not count toward accrued time, with the exception of students entering the doctoral program in electrical engineering, computer science, or music who have earned a master's degree in that discipline. All of the following will count toward accrued time: time spent at UCSD as a master's, non-degree, or intercampus exchange graduate student; time spent on leave beyond three quarters; time spent between completion of or withdrawal from a graduate program at UCSD and re-registration in the same field of study. Precandidacy and total registered time limits will not accrue during periods of leave of absence and/or withdrawal in excess of three quarters.

Further information may be obtained from departmental graduate coordinators or the Office of Graduate Studies and Research.

Academic Residence

The minimum residence requirement for a doctoral degree is six quarters, three of which must be in continuous academic residence at UCSD. Residency is established by the satisfactory completion of six units or more per quarter, at least some of which must be at the graduate level. Joint doctoral students meet the UCSD academic residency requirement by successfully completing a minimum of thirty-six units of course work at UCSD.

A candidate must be registered in the final quarter in which the degree is to be awarded. (See "Registration in the Final Quarter.")

The Doctoral Committee

At least three weeks prior to a scheduled qualifying examination, the department requests approval for the appointment of the doctoral committee by the dean of Graduate Studies. This committee conducts the qualifying examination, supervises the preparation of and passes upon the dissertation, and administers the final examination.

The committee consists of five or more officers of instruction, no fewer than four of whom shall hold professorial titles of any rank. The committee members shall be chosen from two or more departments/programs; at least two members shall represent academic specialties that differ from the student's field and one of these two must be a tenured UCSD faculty member from another department. Consult the departmental graduate coordinator or the Office of Graduate Studies and Research for further details.

Reconstituted Doctoral Committee

For a variety of reasons a doctoral committee may need to be reconstituted. The request for reconstitution of the membership of a doctoral committee must be submitted on a reconstitution form to the dean of Graduate Studies by the chair of the candidate's major department, group, or school no less than two weeks prior to the qualifying examination or defense of the dissertation. The request must include departmental affiliation of the members of the proposed reconstituted committee and the reason(s) for requesting the change.

Qualifying Examination and Advancement to Candidacy

The doctoral committee administers the qualifying examination and authorizes the issuance of the Report of the Qualifying Examination and Advancement to Candidacy. Formal advancement to candidacy requires the student to pay a candidacy fee to the cashier prior to submitting the form to the dean of Graduate Studies for approval. Students must maintain a GPA equivalent to 3.0 or better in upper-division and graduate course work undertaken with a total of no more than eight units of F and/or U grades in order to take the qualifying examination and advance to candidacy.

If the committee does not issue a unanimous report on the examination, the dean of Graduate

Studies shall be called upon to review and present the case for resolution to the Graduate Council, which shall determine appropriate action.

Dissertation and Final Examination

A draft of the doctoral dissertation should be submitted to each member of the doctoral committee at least four weeks before the final examination. The form of the final draft must conform to procedures outlined in the publication, *Instructions for the Preparation and Submission of Doctoral Dissertations and Masters' Theses,* which is mailed to candidates upon their advancement to candidacy.

The doctoral committee shall supervise and pass on the candidate's dissertation and conduct the final oral examination which shall be public and so announced.

If the committee does not issue a unanimous report on the examination, the dean of Graduate Studies shall be called upon to review and present the case for resolution to the Graduate Council, which shall determine appropriate action.

The Report of the Final Examination and Filing of the Dissertation for the Doctoral Degree form is initiated by the department, group, or school, signed by members of the doctoral committee, and the chair of the (major) department, group, or school.

The candidate submits the dissertation to the Office of Graduate Studies and Research and, upon approval by the dean of Graduate Studies, files the dissertation with the university archivist, who accepts it on behalf of the Graduate Council. Acceptance of the dissertation by the archivist, with a subsequent second approval by the dean of Graduate Studies, represents the final step in the completion by the candidate of all requirements for the doctoral degree. All dissertations and theses submitted in partial satisfaction of doctoral or master's degree requirements shall be catalogued and shelved in the university library and dissertations shall be submitted to University Microfilms, Inc., for publication.

Candidate in Philosophy Degree

In several departments, as approved by the Graduate Council, the intermediate degree of candidate in philosophy (C.Phil.) is awarded to students upon advancement to candidacy for the Ph.D. degree. The minimum residence requirement for this degree is three quarters of continuous academic residence at UCSD. The C.Phil. degree cannot be conferred simultaneously with or following the award of a Ph.D. degree.

Letter of Completion

The Office of Graduate Studies and Research will direct the Office of the Registrar to issue a Letter of Completion to a graduate student who has completed all requirements for a higher degree but whose diploma has not yet been issued.

Postgraduate Appointments

A UCSD graduate student is not eligible for any UCSD postdoctoral appointment until all requirements for the Ph.D. degree have been completed. Such appointments may begin after the university archivist has accepted the dissertation and the Office of Graduate Studies and Research has accepted the final report.

Special Degree Programs

Graduate Programs in the Health Sciences

The university offers research training programs in the health sciences leading to the doctor of philosophy degree. The purpose of these graduate programs is to prepare students for careers in research and teaching in the basic medical sciences. Program requirements are flexible, consisting of graduate courses and supervised laboratory or clinical investigation. Graduate programs in the health sciences are offered by (1) regular campuswide departments with activities related to the health sciences, for example, the Departments of Bioengineering, Biology, Chemistry and Biochemistry, and Psychology and (2) interdisciplinary groups of faculty drawn from the School of Medicine and from campuswide departments or from San Diego State University.

The following departments or interdisciplinary graduate groups provide research training opportunities in the biomedical sciences and should be contacted directly for further information: biomedical sciences, biochemistry (in either biology or chemistry and biochemistry), bioengineering, bioinformatics, biology, biophysics, chemistry, clinical psychology, molecular pathology, neurosciences, physics, psychology, public health (in either epidemiology or health behavior), and the Scripps Institution of Oceanography.

Ph.D.-M.D. Program

Students may meet the requirements for both the Ph.D. and M.D. degrees in programs offered jointly by the School of Medicine and the graduate programs in the health sciences. In most cases, students are first admitted to the School of Medicine and may then apply for admission to a relevant graduate program. However, those students who wish to be considered for admission to the Medical Scientist Training Program (MSTP) may apply for admission to the School of Medicine and the MSTP concurrently.

Elements of the first two years of the medical school curriculum satisfy many of the requirements of the graduate program, but additional courses will be required. Thus, the student must complete requirements for the Ph.D. in accordance with the regulations of a department or a group and must in addition meet the requirements for the professional degree. Students interested in such programs should consult the associate dean for Student Affairs, School of Medicine.

Joint Doctoral Programs

Certain departments of the University of California cooperate with similar departments on the several campuses in the California State University System to offer joint programs of study leading to the doctoral degree. At UCSD, joint doctoral programs in audiology, biology, chemistry, clinical psychology, language and communicative disorders, engineering sciences (applied mechanics), mathematics and science education, and public health (in either epidemiology or health behavior) are currently offered in conjunction with San Diego State University and a Ph.D. in drama and theatre is offered in conjunction with University of California, Irvine. Applicants interested in these joint programs should consult the Departments of Biology, Chemistry and Biochemistry, Communicative Disorders, Mechanical Engineering, Psychology, Surgery, Theatre and Dance; or the Office of the Dean, College of Engineering; or the Center for Research in Mathematics and Science Education; or School of Public Health at San Diego State University. Joint doctoral students meet the UCSD academic residency requirement by successfully completing a minimum of thirty-six units of course work at UCSD.

Special Programs

Intercampus Exchange Program for Graduate Students

A graduate student registered on any campus of the University of California, who wishes to take advantage of educational opportunities for study and research available on another campus of the university, must apply to become an intercampus exchange student on that UC campus. UCSD students must have completed at least one quarter of study and be in good standing prior to beginning an exchange.

Informal arrangements between departmental faculty on the two campuses must be undertaken prior to submission of a student's application to assure that space in desired courses, seminars, or facilities will be available.

No later than four weeks prior to the opening of the term on the host campus, a student must complete the Application for Intercampus Exchange Program for Graduate Students available at the Office of Graduate Studies and Research. This application, approved by the student's departmental graduate adviser and and the graduate dean of the home campus, is forwarded for approval by the department and the graduate dean on the host campus.

Students participating in an intercampus exchange must pay all required fees and enroll as appropriate at the home campus. Evidence of fee payment, at the home campus, must be presented to enroll in classes at the host campus.

An exchange student is not admitted to graduate standing at the host campus, but is considered a graduate student in residence at the home campus. Grades obtained in courses taken by the student enrolled in the intercampus graduate student exchange program are transferred to the home campus for entry on the student's official record. Library, health center, and other student privileges are extended by the host campus.

Off-Campus Study

(Other than Intercampus Exchange Program)

If the research and study program of a graduate student requires being off campus for extended periods of five weeks or more, the student may apply for off-campus study. During such periods a student is required to remain a registered student at UCSD and to carry twelve units of course work or research.

If the off-campus study is outside the state of California, one-half of the registration fee may be waived. All required fees including, but not limited to the full educational fee, student center fee, recreation facility fee, health insurance fee, and nonresident fee, if applicable, must be paid.

A graduate student who holds a fellowship, traineeship, or a research assistantship and desires to study off campus may do so under the following circumstances: The student must have completed at least one year of graduate study at UCSD, obtained the approvals of the academic department and the dean of Graduate Studies, and agreed to comply with the rules and regulations governing the award or appointment.

Regulations concerning accepting additional awards or compensation for appointments as outlined under the financial assistance section apply to off-campus study as well as on-campus study.

UCSD Extension

Students wishing to offer UCSD Extension course work taken **prior** to admission at UCSD as a graduate student in partial satisfaction of requirements for a master's degree must file a General Petition with the Office of Graduate Studies and Research. Acceptance of such course work is subject to the regulations on "Transferring Credit" (which are described elsewhere in this catalog) the recommendation of the major department, and approval of the dean of Graduate Studies, and will be considered upon satisfactory completion of course work in a regular session.

COMPLIMENTARY ENROLLMENT

Through a reciprocal agreement with UCSD Extension, a limited number of spaces in extension classes are open to full-time graduate students (registered for twelve units or more) in good standing without payment of additional fees. The number of spaces available for each quarter varies. The student must obtain a UCSD Application for Enrollment from the Office of Graduate Studies and Research and personally secure the necessary approvals. Course work taken through Complimentary Enrollment cannot be used in partial satisfaction of requirements for a master's degree, nor can it be used toward the twelve unit full-time enrollment requirement.

Education Abroad Program

Graduate students may apply to study at most Education Abroad Program (EAP) host institutions, provided that they meet EAP requirements and have completed at least one year of graduate work prior to departure, are in good standing, and have the support of their academic department and graduate dean.

Costs vary according to location.

Students pay fees to the University of California and are enrolled at UCSD while abroad. Full academic credit is received for courses satisfactorily completed.

At UCSD, complete information and application forms for the various overseas campuses may be obtained from the Programs Abroad Office, International Center, University Center, 0018 or on the Programs Abroad Web site http://orpheus.ucsd.edu/icenter/. In addition, the Programs Abroad Office also offers information and advisory services to graduate and undergraduate students interested in pursuing other activities involving study, research, work, or travel abroad.

For a detailed list of the countries with EAP study centers, see also Education Abroad Program in chapter entitled "Courses, Curricula, and Programs of Instruction." Study abroad information is also available online by accessing the EAP Web site http://www.uoeap.ucsb.edu.

Postdoctoral Study

Postdoctoral fellows, trainees, scholars, and medical fellows play an important role in UCSD's teaching and research programs. All interested candidates should make advance arrangements with the appropriate department or research unit. The Office of Graduate Studies and Research has administrative responsibility for the appointment and census of postdoctoral scholars undertaking training at UCSD. A scholar is appointed by means of a Postdoctoral Study Appointment form initiated in the office of the faculty sponsor and is eligible for a UCSD academic photo identification card and library privileges. The scholar is also eligible to purchase OGSR-sponsored Health Net medical and DentiCare dental insurance.

All scholars are required to have adequate health insurance. Information on Health Net, DentiCare, and enrollment procedures may be obtained from administrative offices of departments, organized research units, or OGSR.

Fees

The following schedule of fees is anticipated for the 2004–2005 academic year:

FEES PER QUARTER*

	Resident	Non-Resident
Tuition	$	$4,082.00
Registration	238.00	238.00
Educational	1,502.00	1,584.00
Student Center	37.50	37.50
Recreational Facilities	87.00	87.00
Graduate Student Assoc.	12.00	12.00
Health Insurance	362.00	362.00
Totals	$2,238.50	$6,402.50

Miscellaneous Fees and Fines

Students should also be aware of the following charges:

Application fee for admission	$40
Duplicate Photo-ID card	10
Petition for Readmission	40
Advancement to Candidacy for Ph.D.	50
Transcript of Record	5
Late payment of fees (Late registration)	50
Late enrollment	50
Late and retroactive Add/Drop	3
Returned check collection	25
Filing fee	119
UCSD Statement Late Charge	25

* Subject to change without notice. Updated information regarding fees may be found on the Web site https://ogsr.ucsd.edu/financialinfo/gradstudent/tuition_fees/index.htm.

All receipts for payments made to the cashier, whatever their nature, should be carefully preserved. Not only do they constitute evidence that financial obligations have been discharged, but they may be required to support a claim that certain documents or petitions have been filed.

**Fees for graduate students approved for enrollment in a half-time program (not to exceed six units) may be reduced by one-half of the Educational fee and one-half of nonresident tuition for nonresidents.

California Residency and the Nonresident Tuition Fee

Each new student entering UCSD is required to submit a Statement of Legal Residence to the Office of the Registrar. No tuition is charged to students classified as residents of California. Nonresidents, however, are required to pay a quarterly tuition fee.

A complete statement covering California residence requirements, determination of residence for tuition purposes, and/or recognized exceptions appears in the section "Residence Requirements" or on the Web site https://hollerith.ucsd.edu/cgibin/studentlink.p1/5/students/finances/residency/. Additional information may be obtained from the Campus Residence Deputy, Office of the Registrar, Building 301, University Center. No other university personnel are authorized to supply information relative to residence requirements for tuition purposes. Students seeking to establish California residency for tuition purposes are advised to review the requirements and deadlines. Adherence to the published deadlines is the responsibility of each student and is essential. Exceptions to waive or extend deadlines are not considered.

To the extent funds are available, subject to change, waiver of nonresident tuition may be granted to spouses and dependent, unmarried children under age twenty-one of university faculty members who are qualified for membership in the Academic Senate. Inquiries should be directed to the Office of the Registrar or the Academic Senate Office.

University Registration Fee

The university registration fee is a quarterly fee required of all registered students, and it must be paid at the time of the student's registration. This fee is for services which benefit the student and are complementary to, but not part of, the regular instructional programs of the university. No part of this fee is refunded to students who do not make use of these services; however, students who petition and are approved for out-of-state study will receive a waiver for one-half of the registration fee. Exemption from this fee may be granted to surviving children of certain deceased California fire fighters or police officers. Students who believe they may qualify for an exemption on this basis must consult with the Student Financial Services Office, Building 201, University Center, for a ruling.

Student Health Services and Insurance Plans

The Student Health Service (SHS) is a nationally accredited health care facility providing primary health care for no or minimal charge during the academic year for all students who pay the university registration fee. Students with the Graduate Student Health Insurance Plan (GSHIP) in the spring have access to the SHS during the summer at no additional charge. Students without GSHIP may be seen in the summer for a modest fee. Additional information on the wide variety of services available at SHS is available via the Web at www.ucsd.edu/shs.

SHS provides primary health care to all students with GSHIP. Access to GSHIP benefits requires written SHS referral except in cases of emergency care or 100 miles out of the UCSD area.

The Graduate Student Health Insurance (GSHIP)

GSHIP is a mandatory year-round insurance plan for graduate and professional students unless a waiver has been granted (see WAIVERS). Students must be enrolled in GSHIP for the spring quarter in order to retain coverage through summer. Three quarterly payments will provide year-round coverage under GSHIP. The spring quarter premium extends insurance coverage through the summer quarter. Benefits and additional information may be viewed at the Web site www.ucsd.edu/shs.

Premium payment for GSHIP is due with the payment of the registration fee. Premiums for students holding graduate academic appointment titles for a full academic term at 25 percent time or greater will be paid directly by the university. Premiums for most students holding fellowships and training grants are also paid directly. Loans to cover premiums may be available for students who receive need-based financial assistance.

For first-year students arriving on campus prior to the start of the academic calendar year, it is highly recommended that the student review current insurance status and purchase short term coverage if necessary. Insurance information may be obtained by calling the insurance counselor at (858) 534-2123.

REFUNDS

No premium refunds are permitted, except when a student withdraws on or prior to the first day of classes, in which case a full refund of the premium will be made and coverage for that quarter will be canceled effective from the first day of the quarter. If an insured enters the armed forces, a pro-rata refund of premium paid will be

made upon request. Refunds for all other fees are subject to the Refund Fee Schedule published in the *Schedule of Classes*. That refund schedule is effective beginning on the first day of the quarter and counts **all** calendar days. Students cannot expect exceptions to this schedule, regardless of the circumstances of the leave of absence/withdrawal request.

LEAVE OF ABSENCE

A student is eligible to be enrolled in GSHIP when on approved Leave of Absence for a total of three academic quarters. A student on approved leave is responsible for his or her enrollments and premium payments and for the Student Health Service access fee which is payable each quarter including summer. Enrollment in GSHIP is through the Student Health Insurance Office at the Student Health Services (SHS).

WAIVERS

Students already insured under a policy containing benefits equal to or better than GSHIP may be eligible for GSHIP waivers up to one academic year. Documents required for a waiver are: 1) student's written request, 2) proof of present insurance and premium payment to the end of the quarter, 3) a copy of the summary of insurance benefits, and 4) a copy of the insurance identification cards. Submit written requests directly to UCSD, Student Health Insurance Office, 9500 Gilman Drive, Dept. 0039, La Jolla, CA, 92093-0039 no later than the last business day of the first week of the quarter. Final decisions regarding waiver requests will be mailed to the student by SHS.

Educational Fee

The educational fee was established as a required fee for all students beginning with the fall quarter 1970. It is used to cover a variety of educational costs as determined by the regents. The educational fee may be reduced by one-half for students enrolled in six units or fewer (see "Part-time Study").

Student Center Fee

Every student is required to pay a student center fee each quarter.

Recreation Facility Fee

Every student is required to pay a recreation facility fee each quarter.

Reduced Fee Enrollments

1. One-half of the established registration fee may be waived for graduate students whose research or study requires them to remain outside the state of California for five weeks or more of the quarter. Students must file a General Petition for this privilege. The reduction pertains to one-half of the registration fee only. A student must pay, in addition, all required fees including, but not limited to, the educational fee, student center fee, recreation facility fee, health insurance fee, and nonresident tuition fee, if applicable.
2. Graduate students approved for enrollment in a half-time program (not to exceed six units) are eligible for a reduction in fees of one-half the educational fee, and, if applicable, one-half of the nonresident tuition fee.
3. A full-time employee who is not subject to nonresident tuition, who has worked full time for the university for at least six months prior to the latest date that registration will be accepted, and who meets the admission requirements of the university is eligible for two-thirds reduction of both the university registration fee and the university educational fee for up to nine units or three regular session university courses per quarter, whichever is greater. An employee so registered is ineligible for the services and facilities of the Counseling Center, recreation facilities, or the Student Health Services, other than those services to which the employee is regularly entitled (University of California Staff Personnel Policy 260.23). Authorization for this privilege is secured from the Staff Personnel Office for staff employees, or from the Academic Personnel Office for individuals on academic appointments.

NOTE: In accordance with Academic Senate regulations, no voting member of the San Diego Division of the Academic Senate shall be recommended for a higher degree from UCSD unless the dean of Graduate Studies shall have certified that all requirements for that degree have been met prior to the appointment to a rank carrying the voting privilege.

Filing Fee

A student registered in the immediately preceding quarter, or on an approved leave of absence who has completed all requirements except for the final reading of the dissertation or thesis or the taking of the final examination is eligible to petition to pay a filing fee in lieu of registering and paying all required fees in the final quarter. The filing fee applies to both residents and nonresidents. Students must apply for this privilege by means of a General Petition.

Refund of Fees

Students who withdraw from the university during the first five weeks of instruction (35 calendar days) may receive partial refunds of fees, excluding health insurance, if applicable. The date of withdrawal, as related to the fee refund schedule, shall be the date on which notice of withdrawal is submitted to the Office of Graduate Studies and Research (OGSR). See Schedule of Classes for schedule of refunds.

Parking Fee

Students who park motor vehicles, including motorcycles, on the campus are subject to parking fees. (See "Parking," in chapter entitled "Campus Services and Facilities.")

Penalty Fees

Penalty fees (see "Fees"), are charged for failure to comply with normal deadline dates. To avoid such fines, students should fulfill all requirements in advance of the deadlines listed in the Schedule of Classes.

Transcript Fees

Students may obtain transcripts of their UCSD records from the Office of the Registrar for $6 for each copy. Transcripts must be requested several days in advance of date needed.

Late Fees

Students are responsible for meeting quarterly enrollment and registration (fees payment) deadlines which are published on StudentLink, in the Schedule of Classes, and a variety of student-directed Web sites and publications. A $50 late fee will be assessed for late enrollment and/or late registration up to $100 total. Late enrollment automatically causes late registration as payments cannot be credited to a student's account until enrollment occurs. Late fee waivers are rarely granted and only in extenuating and verifiable circumstances. Only certain staff in the Office of Graduate Studies and Research (OGSR) are authorized to grant waivers.

Financial Assistance

Several kinds of financial assistance are available to graduate students at UCSD. These include fellowships and traineeships; assistantships in teaching, language instruction, and research; scholarships in full or partial payment of tuition and/or fees; and loans and grants-in-aid. Further details about these awards/appointments may be obtained from departmental, group, or school offices.

Descriptions in this section deal entirely with awards administered directly by the university.

Applicants for financial assistance should note the following: "Pursuant to Section 7 of the Privacy Act of 1974, applicants for student financial aid or benefits are hereby notified that mandatory disclosure of their Social Security number is required by the University of California to verify the identity of each applicant. Social Security numbers are used in processing the data given in the financial aid application; in the awarding of funds; in the coordination of information with applications for federal, state, university, and private awards or benefits; and in the collection of funds and tracing of individuals who have borrowed funds from federal, state, university, or private loan programs."

Fellowships and Traineeships

Regents Fellowships, offered to students with excellent academic and research qualifications, provide a stipend of $10,000 for nine or ten months, plus tax-free resident fees and nonresident tuition, if applicable. These awards may be supplemented with a partial graduate student researcher or research fellowship from available departmental resources. The amount of the supplement varies by department.

The San Diego Fellowship is designed to increase the quality of education and research by enhancing campus diversity. Currently it provides a minimum stipend of $1,000 per month plus resident fees and one year of nonresident tuition. These awards are usually given for two years. Academic departments are responsible for two additional years of support for the Ph.D., D.M.A., or Ed.D. students awarded this fellowship. Look online at http://ogsr.ucsd.edu/fellowships/sd_fellowship/index.htm for further information.

The seven most outstanding nominees for the San Diego Fellowship are awarded the Cota-Robles Fellowship. Fellows receive a $15,000 stipend plus fees for two years. Non-resident fellows are eligible for a tuition scholarship in their first year. Doctoral fellows are guaranteed comparable departmental support for at least two additional years.

The Minority Access to Science, Engineering and Mathematics (MASEM) program is funded by the National Science Foundation (NSF). This fellowship is awarded to a limited number of new underrepresented graduate students in selected programs in science, mathematics, and engineering. For further information, look online at http://ogsr.ucsd.edu/masem/index.htm.

The NIH Scholars Program is funded by the National Institutes of Health (NIH). This award is for a limited number of new graduate students from underrepresented groups in biomedical and behavioral science programs. For further information look online at http://ogsr.ucsd.edu/nih/index.asp.

All other fellowship stipends are established by the department, group, or school and may vary in tenure from one to twelve months and in any amount up to a maximum of $3,000 per month. Fellowships awarded for one, two, or three quarters will also provide tax-free resident fees and nonresident tuition, if applicable. Awardees must register for twelve units of upper-division and graduate-level work each quarter and must remain in good academic standing, as described under "Standards of Scholarship" of this catalog.

Fellows and trainees on twelve-month tenure are required to devote full time to graduate study and research during the summer as well as during the academic year. A brief resume of proposed summer graduate study or research, approved by the appropriate adviser, must be filed with the dean of Graduate Studies before the end of the spring quarter preceding the summer portion of the fellowship or traineeship tenure.

Some fellowships and traineeships offer the privilege of participation in the teaching or research programs of the university.

The principal types of fellowships/scholarships at UCSD are the following:

1. Regents Fellowships
2. San Diego and Cota-Robles Fellowships
3. Research Fellowships
4. U.S. Public Health Service Predoctoral Traineeships
5. Fee Scholarships
6. Tuition Scholarships
7. Tuition and Fee Scholarships

Assistantships

Graduate students may be appointed by UCSD on a part-time basis as graduate student researchers and teaching assistants.

Graduate students enrolled full-time (twelve units or more) may be appointed up to 50 percent time (twenty hours/week) during the academic year and 100 percent time during the summer months, although most departments limit support to 50 percent time year-round. Students enrolled for less than full-time (one to eleven units) are eligible, at the discretion of the department, for 25 percent time appointments. Appointees must remain in good academic standing, as described under "Standards of Scholarship."

Graduate students who are appointed as graduate student researchers are eligible for remission of tuition and fees if they have a minimum 25 percent appointment for the entire quarter for which tuition and fees are paid, or the dollar equivalent; have an appointment effective with the first week of instruction in the quarter for which tuition and fees are paid; and are within the time limits for support described earlier in this section.

Teaching assistants and others appointed on academic titles at 25 percent time or more for the quarter are eligible for payment of partial fee remission of 100 percent of the annual education and registration fees and 100 percent of the Graduate Student Health Insurance fee.

Graduate students appointed as teaching assistants, associates, readers or tutors (ASE'S) are represented by the Association of Student Employees/UAW under a collective bargaining agreement with the university. All salary payments under these titles are subject to a deduction of 1.15 percent for union membership dues or a 0.92 percent agency fee deduction for students who choose not to become members of the union. The university/UAW Agreement can be retrieved electronically at http://ogsr.ucsd.edu/ase/index.htm

All graduate students who are U.S. citizens and appointed as teaching assistants or graduate student researchers or are employed by the university in other positions are required by the California Constitution to sign the State Oath of Allegiance. In addition, all graduate student

appointees and employees are required by university policy to sign the university's Patent Agreement. Copies of both documents may be obtained from the student's academic department.

Taxability of Awards

Under the 1986 Tax Reform Act, the taxability of awards is as follows:

1. *Fellowships and Scholarships.* The portion of the stipend used for tuition, fees, books, and course-related expenses required of all students in the course are *not* taxable income. The portion of a stipend used for other purposes are taxable income.
2. *Graduate Student Researchers and Teaching Assistants.* All compensation is taxable income.
3. Payment of tuition and fees under the Graduate Student Researcher Tuition and Fee Remission program and payment of partial fee remission and graduate student health insurance for those appointed 25 percent time or more as teaching assistants or other academic titles, is nontaxable income.
4. *Grants for Travel to Scholarly Meetings and for Graduate Student Research Expenses.* May be taxable.

Students are advised to review available tax materials and make their own decisions about tax withholding, reporting of income, excluding income from taxation, and filing required tax forms. UCSD departmental and central administrative staff are not able to advise students on individual tax matters.

Graduate student fellowships, scholarships and traineeships are not subject to withholding for taxes under the Federal Insurance Contribution ACT (FICA). The salary of graduate students appointed as Teaching Assistants and Graduate Student Researchers, Readers, or Tutors, or who are employed on campus is exempt from FICA if the students are registered for a minimum of 6 units each quarter (including summer). Nonresident aliens on F-1 and J-1 visas are, by federal law, exempt from FICA.

Limited written tax information is available from academic departmental offices and the Office of Graduate Studies and Research.

Application Procedures

Entering students. The online application for graduate admissions form is used to apply for any of the following: fellowships, traineeships, scholarships, and assistantships (teaching, language, or research).

In order for an applicant to be considered for the ensuing academic year, all supporting materials must be received by the department application deadline. No assurance can be given that requests for fellowships, traineeships, or scholarships can be processed after stated deadlines. Requests for assistantships may be accepted after the deadline, but most departments offer assistantships at the same time they consider applications for fellowships. Therefore, applicants for these appointments are strongly urged to submit their requests as early as possible.

Continuing and returning students. Consult with their departments.

Award Notification

The awarding of fellowships and similar awards for the following academic year will be announced not later than April 1. UCSD subscribes to the agreement of the Council of Graduate Schools of the United States, under which successful applicants for awards are given until April 15 to accept or decline such awards. An award accepted from one of the member universities may be resigned at any time through April 15. However, an acceptance given or left in force after that date commits the student not to accept another appointment without first obtaining formal release for that purpose.

Loans and Grants-in-Aid

An excellent package of grants-in-aid, work-study, and loans is available to graduate students who show evidence of financial need as determined by analysis of a completed Free Applica-tion for Federal Student Aid (FAFSA).

See section on financial assistance in chapter entitled "Campus Services and Facilities."

Time Limits for Graduate Student Support

For Ph.D. and D.M.A. students, all financial support administered by UCSD (including fellowships, scholarships, and appointment but excluding loans) is restricted to students who are within their departmental support time limits (see "Ph.D. Time Limits" and description of each department's graduate program).

M.F.A. and M.P.I.A. students can be supported for a maximum of ten quarters. M.A. and M.S. students can be supported for a maximum of seven quarters.

Fellowships and Research Awards from Outside the University

In addition to fellowships, traineeships, and loans administered by the university, other types of graduate student support are available through federal agencies and private foundations. Students wishing to explore such sources of support for their studies at UCSD are urged to consult one of the many directories available in the reference section of Geisel Library, the fellowship listings provided via the Graduate Studies World Wide Web site (http://ogsr.ucsd.edu), the Community of Science Web site (www.cos.com), other Web sites dedicated to graduate fellowships, through the reference departments of other large libraries or the fellowship adviser in the Office of Graduate Studies and Research, 518 University Center. Most application deadlines occur in the fall or early winter. Among the many organizations which award fellowships to students at UCSD are the Department of Defense; the Ford Foundation; the Hertz Foundation; Institute of International Education; the National Aeronautics and Space Administration; the National Science Foundation; the Social Science Research Council; and, the Woodrow Wilson National Fellowship Foundation.

General Policies and Requirements

Integrity of Scholarship

See "UCSD Policy on Integrity of Scholarship" in the Academic Regulations section of this catalog.

Student Conduct

Graduate students enrolling in the university assume an obligation to conduct themselves in a manner compatible with the university's function as an educational institution. Rules concerning student conduct, student organizations, use of university facilities, and related matters are set forth in *UC San Diego Campus Regulations Applying to Campus Activities, Organizations, and Students,* copies of which are available online at http://ugr8.ucsd.edu/judicial and at the Office of Graduate Studies and Research, and the Office of Judicial Affairs.

Student Appeals

ACADEMIC APPEALS

Department and program faculty have primary responsibility for maintaining the excellence of graduate programs, and they are in the best position to judge their students' academic performance. Consequently a graduate student appeal of an academic decision should first be made to the individual faculty member who made the decision. If this does not result in a resolution that is satisfactory to the student, he or she may appeal to the department or program chair. Graduate students may appeal a course grade or Ph.D. or master's qualifying or final exam result only if they believe that nonacademic criteria were used in determining their grade. Students who wish to appeal a course grade should follow the procedure described in "Grade Appeals" in the "Academic Regulations" section of the UCSD General Catalog.

EMPLOYMENT APPEALS

Students holding an academic appointment, such as graduate student researcher, are subject to the Academic Personnel Manual policy 140. A copy of this policy is available in the Office of Graduate Studies and Research or it may be viewed online at http://www.ucop.edu/acadadv/acadpers/apm/apm-140.pdf. Appeals by teaching assistants, readers, and tutors are covered by the ASE/UAW contract that may be viewed at http://ogsr.ucsd.edu/ase/index.htm.

NON-ACADEMIC APPEALS

Graduate students may appeal actions of departments, programs, individual faculty members, departments, or administrators relating to a student's academic program or financial support if they believe that:

1. due process was not followed in arriving at a decision

   OR

2. personal prejudice affected the judgment rendered.

A non-academic appeal may be submitted to the department or program chair, individual faculty member, or administrator within one month of the date of learning of the action or the date that the student should have reasonably known of the action.

If an appeal to an individual faculty member or administrator is not resolved to the student's satisfaction, he or she may then submit a written appeal to the department or program chair, who shall attempt to adjudicate the case with the faculty member or administrator and the student within two weeks.

If the appeal is not resolved to the student's satisfaction, he or she may then attempt to resolve the matter through written appeal to the dean of Graduate Studies, who will attempt to adjudicate the case within two weeks. The dean may take the appeal to the Graduate Council for review, which may extend the time required to reach a final resolution.

The student's request for the dean's review should include a written statement describing the nature of the grievance, along with copies of any and all documents in his or her possession supporting the grievance. Students are encouraged to contact the assistant dean for Student Affairs in the Office of Graduate Studies and Research for assistance with the appeal process.

Exceptions

A student may request an exception to the normal procedures and requirements governing graduate studies by submitting a General Petition, available from the department. The petition must state clearly the reasons for requesting the exception and bear all required approvals before being submitted to the Office of Graduate Studies and Research.

Requests for exceptions to time limits require a letter of explanation and support from the student's research adviser, and support and justification from the program's graduate adviser and endorsement by the department or group chair. Such requests are submitted to the Graduate Council through the dean of Graduate Studies. Exceptions to the time limits policy are granted only in the case of truly exceptional and unavoidable circumstances.

Grades

Standards of Scholarship

Only upper-division, graduate, and professional courses in which grades of A, B, C (including plus [+] or minus [–]), D, or S (Satisfactory) are earned can be counted in satisfaction of the requirements for a higher degree.

A student's grade-point average (GPA) is computed by dividing the total number of grade points earned by the total unit value of graded upper-division, graduate, and professional courses undertaken at UCSD with the exception of those undertaken in UCSD Extension. Grades of S, U, I, IP, NR, and W are excluded in computing a grade-point average. Lower-division course work units are not used in computing a graduate student's grade-point average nor in satisfying program requirements for a higher degree with the exception of language courses taken by students in the M.P.I.A. program.

Each department or group prepares, not later than the second week of each spring quarter, a detailed, written evaluation of each of its Ph.D., D.M.A., or M.F.A. students. These evaluations are designed to inform students of their progress and to improve communications between faculty and graduate students. Evaluations are discussed with students who may elect to add written comments before signing the copy of the evaluation sent to the Office of Graduate Studies and Research. A student's signature on the evaluation indicates knowledge of the assessment but does not necessarily signify agreement.

To be in good standing academically a graduate student must meet departmental standards including a satisfactory spring evaluation, maintain a GPA of 3.0 or the equivalent in upper-division, graduate, and professional course work, and must not have accumulated more than a total of eight units of F and/or U grades overall, unless departmental standards specify more stringent grade requirements.

Good standing is a requirement for:

1. Holding academic and staff appointments.
2. Holding fellowship, scholarship, or traineeship appointments.
3. Participating in the Education Abroad Program (EAP)
4. Advancing to candidacy for a graduate degree.
5. Going on leave of absence.
6. Receiving a graduate degree from UCSD.

Graduate students who are not in good standing for any reason are subject to probation and/ or disqualification from further graduate study.

Grading System

The grade of A+, when awarded, represents extraordinary achievement but does not receive grade-point credit beyond that received for the grade of A. The grades of A, B, and C may be modified by plus (+) or minus (–). When attached to the grades of B and C, plus (+) grades carry three-tenths of a grade point more per unit, and when attached to A, B, and C, minus (–) grades carry three-tenths of a grade point less per unit. Grades and grade points are described as follows:

Grade		Grade Points per Unit
A+		4.0
A	Excellent	4.0
A–		3.7
B+		3.3
B	Good	3.0
B–		2.7
C+		2.3
C	Fair	2.0
C–		1.7
D	Poor	1.0
F	Fail	0.0
S	Satisfactory (equivalent to B– or better)	0.0

Grade	
U	Unsatisfactory
I	Incomplete—but work of non-failing quality*
IP	In Progress (provisional grade; replaced when full sequence is completed)
W	Withdrawal (assigned when withdrawing or dropping a course beginning fifth week to end of ninth week of instruction)

* Requires Request to Receive Grade Incomplete form to be initiated and completed by the student, approved by the instructor, and filed with the department prior to the end of finals week. The Incomplete grade will lapse to F or U if not made up by the last day of finals week in the following quarter.

All grades except Incomplete and In Progress are final when entered in an instructor's course report filed at the end of the quarter.

While grades of U are not computed in a grade-point average, they are not considered satisfactory grades for students on appointment, nor are they considered to be evidence of satisfactory progress on the part of any student. Therefore, a student whose record bears more than eight units of U and/or F grades in upper-division, graduate, or professional course work may not be eligible to continue on appointment and may be subject to academic probation or disqualification.

Changes in Grades

All grades except I and IP are final when filed by the instructor unless a clerical or procedural error is discovered.

No change of a final grade may be made on the basis of revision or augmentation of a student's work; no term grade except Incomplete may be revised by further examination; and no grade may be changed after one calendar year from the time the grade was recorded.

Repetition of Courses

A student assigned a grade of D, F, or U may petition to repeat the course on the same grading basis for which it was first taken. That is, a course in which a grade of D or F has been received may not be repeated on an S/U basis. Conversely, a course in which a grade of U has been awarded may not be repeated on the basis of a letter grade. Degree credit for a course will be given only once, but the grade assigned for each enrollment shall be permanently recorded. Only the grade received in the repetition of the course will be used in calculating the overall grade-point average for the first sixteen units repeated. For additional units repeated, the grade assigned for each enrollment shall be used in calculating the grade-point average.

No Report/No Record

A blank entry appearing on student transcripts in lieu of a grade indicates that the student's name appeared on a grade report but no grade was assigned by the instructor. A blank entry will lapse automatically into an F or U if not removed or replaced by a final grade by the last day of instruction of the subsequent quarter, and will be computed in the student's GPA.

I (Incomplete)

The grade of I may be assigned by an instructor only when the student's work is of passing quality but is incomplete. The student must complete and submit to the instructor the form, Request to Receive Grade Incomplete and Removal of Grade Incomplete, which will contain both the reason for requesting the grade I and the conditions to be met before the Incomplete can be replaced with a final grade. The Incomplete must be made up, the grade assigned, and the completed form filed with the Office of the Registrar no later than the end of final examination week the following quarter.

Incomplete grades assigned in the quarter before a graduate student withdraws or takes an approved leave of absence must be replaced by a final grade before the end of the academic quarter following to prevent the Incomplete from lapsing to F or U.

IP (In Progress)

An IP is assigned in a sequential course which extends over more than one quarter, and the evaluation of a student's performance may not be possible until the end of the course. A student who has dropped out without completing the entire sequence may be assigned final grades and unit credit for any quarter(s) completed, provided that the instructor has a basis for assigning the grades and certifies that the sequence was not completed for good cause. An IP not replaced by a final grade will remain on the student's record. Courses graded IP are not used in calculating a student's grade-point average until graduation. At that time course units still graded IP on a student's record must be treated as units attempted in calculating the GPA; **thus units graded IP will have the same effect on the overall GPA as an F or U.**

S/U (Satisfactory/Unsatisfactory)

The minimum standard of performance for a grade of Satisfactory shall be the same as the minimum for a grade of B–.

With the approval of the Graduate Council, departments may offer graduate courses in which graduate students may elect to be evaluated on an S/U basis and courses in which S/U grading shall be the *only* grading option. Grading options for a given course are identified in course listings in the *UCSD General Catalog.*

In addition, and with the approval of the department and the instructor concerned, graduate students may elect to have the following courses graded on an S/U basis: any upper-division or lower-division course taken (provided they have obtained approval of the instructor and the department), and any graduate or upper-division course outside their major department. If departmental requirements have been fulfilled for advancement to candidacy for the Ph.D. or D.M.A.

degree, graduate students may take any course on an S/U basis.

Selection of S/U as a grading option **must be made in the first two weeks of a quarter.** Units graded Satisfactory shall be counted in satisfaction of degree requirements but shall be disregarded in determining a student's grade-point average. No credit shall be allowed for work marked Unsatisfactory.

W (Withdrawal)

Students who discontinue graduate study any time during a quarter without formally withdrawing will receive failing grades for all course work undertaken. Formal withdrawal requires filing a Leave of Absence, Extension and/or Withdrawal form prior to leaving campus with the Office of Graduate Studies and Research after receiving departmental approval and all other approvals listed on the form. When a student withdraws before the end of the fourth week of instruction, no course entries will appear on the transcript for that quarter. Students who withdraw from the university or drop a course between the beginning of the fifth week of instruction and the end of the ninth week of instruction will be assigned a W (Withdrawn) by the registrar for each course affected.

Courses in which a W has been assigned will be disregarded in determining a student's grade-point average.

Final Grades

Students may access their full UCSD graduate academic record on StudentLink in the academic history module. The student must have his/her PID and PAC numbers to access StudentLink. If lost or misplaced, the PAC number may only be obtained from the Office of the Registrar (OAR) after providing proof of identification; the PID may be obtained through the departmental graduate program coordinator or the OAR. Students may receive computer-generated telephone verification of their fall and winter grades (see Schedule of Classes for complete information). While grade reports submitted by instructors at the end of the quarter are generally considered final, **students should carefully examine their grade report or transcript for omissions and clerical errors and consult with instructors and the Office of the Registrar to clarify any discrepancies.**

Admission Requirements

Academic

Applicants for graduate admission must present official evidence of receipt of a baccalaureate degree from an accredited institution of higher education or the equivalent, with training comparable to that provided by the University of California. A minimum scholastic average of B or better is required for course work completed in upper-division, or prior graduate study.

Admission Policies

Duplication of Advanced Degrees

Normally, duplication of advanced academic degrees, M.A., M.S., Ph.D., is not permitted. A duplicate academic degree is one at the same level, e.g., a second master's degree or second Ph.D., regardless of the discipline or the specialization awarding the degree. A professional degree at the master's or doctoral level, e.g., M.Ed., M.P.I.A., MD. Pharm.D., is not regarded as a duplicate of an academic degree.

Students who already hold an advanced degree may be admitted to UCSD to pursue a second advanced degree at the same level only under limited circumstances, and only with the consent of the Graduate Council. Recognizing that there are circumstances in which it is appropriate for a student to pursue a second degree, the Graduate Council will consider the following criteria when reviewing requests for permission to do so at UCSD.

1. The degree already held by the student must be in a fundamentally different disciplinary field from the department to which the student is applying. A request for permission to be admitted to a degree program at UCSD should document this clearly, and should indicate the differences both in intellectual training and in qualification for future employment that the second degree would confer.
2. The department or program considering the applicant must make a clear case that there is no other way at UCSD for the student to obtain the same outcome for future employment prospects, e.g., by pursuing a master's program or post-doctoral study rather than a second Ph.D.

If the decision of the Graduate Council is that the student should be admitted to a particular department or program for a master's degree alone, the student is barred from requesting permission to continue for a Ph.D. in that department or program.

Non-Degree Study

There is no "student-at-large" classification at UCSD; application for admission must be made to a specific department or group. Applicants who wish to enroll for "course work only" within a department or group and who do not intend to pursue a higher degree at UCSD may request admission for non-degree study. Applicants for non-degree study must satisfy all admission requirements and are not eligible for fellowships or assistantships. Non-degree status is granted for up to one year; students may petition the dean of Graduate Studies for a second year of non-degree status.

Part-Time Study, Including Half-Time

Students who enroll in fewer than twelve graduate or upper-division units each quarter are considered part-time students. International students on F1 or J1 visas must be enrolled full-time each quarter. Students who are approved by their major department and by the dean of Graduate Studies for enrollment in a program of half-time study (maximum of six units or fewer) for reasons of occupation, family responsibilities or health, may be eligible for a reduction in fees. All other part-time students (7–11 units) pay the same fees as full-time students.

Part-time study may be pursued in several masters' programs and a few Ph.D. programs at UCSD. In all instances, part-time students must satisfy the same admission requirements as full-time students and are eligible, at the discretion of a department, for appointment to 25 percent time teaching or research assistantships. Admitted students must file the petition for half-time study with the Office of Graduate Studies and Research no later than the last day of the second week of the quarter to be eligible for a fee reduction.

Application Procedures

When to Apply

Most graduate programs have an application deadline of mid-January for fall admissions. A few programs accept applications for winter and spring admissions. For specific deadlines refer to the online application instructions at http://ogsr.ucsd.edu or contact the specific program office. Applicants need not have completed their undergraduate programs prior to applying.

How to Apply

UCSD encourages the use of the online application and payment of the $60 nonrefundable application fee by credit card. The online application can be accessed at http://ogsr.ucsd.edu where detailed instructions for completion of the application are provided. If a paper mail-in application is necessary, it must be obtained from the academic department where the applicant is applying.

Additional program and application information can be obtained from each graduate program office. Access the UCSD Web site http://ucsd.edu and the appropriate program's graduate study information. Telephone numbers and campus addresses are listed with the department information in this catalog. The Graduate Admissions Application includes application for a fellowship, traineeship, scholarship, or assistantship. The primary documents required in support of an application are listed below. Each program may require additional documents.

Social Security Number Disclosure

Pursuant to the Federal Privacy Act of 1974, applicants are hereby notified that disclosure of their Social Security number is mandatory. The Social Security number entered on the application for graduate admission may be used as the applicant's identification number for part of the UCSD graduate student record keeping system. A personal identification (PID) number will also be assigned by the UCSD student information system for record-keeping purposes. This record-keeping system was established prior to January 1, 1975 pursuant to the authority of the Regents of the University of California under Art. IX, Sec. 9 of the California Constitution.

Required Supporting Documents

All supporting documents, including letters of recommendation, should be completed using the online system. Any additional supplemental materials are mailed directly to the applicant's prospective major department.

ACADEMIC RECORDS

Applicants must request that official transcripts of all previous academic work, including certification of degrees received or documentation of status upon leaving each institution, be forwarded to their prospective major department. Transcript labels can be printed from the online application site. Only official records bearing the signature of the registrar and the seal of the issuing institution will be accepted. Applicants with academic work in progress who expect to complete a degree program before the intended date of enrollment at UCSD **must submit evidence of degree conferral** and a final academic record, as soon as they are available. The undergraduate degree must be completed prior to the start of graduate study.

SPECIAL NOTE TO INTERNATIONAL APPLICANTS

In all applications for graduate admission, official records bearing the signature of the registrar or other responsible academic officer and the seal of the issuing institution are required. However, true copies, facsimiles, or photostatic copies of **foreign academic records** will be accepted if, after the copies have been made, they have been personally signed and stamped by an educational official of the issuing institution, **who certifies that they are exact copies of the original document.** Properly signed copies should be sent instead of irreplaceable original documents. Unless academic records are issued in English by the institution itself, **certified English translations must accompany official documents written in a language other than English.**

Foreign academic records should show all courses attended each year, examinations passed, seminars completed, and grades or marks received in all institutions where formal records are maintained. **Official evidence of degree conferral must also be supplied,** together with evidence of rank in class if possible.

GRADUATE RECORD EXAMINATIONS (GRE) SCORES

Most graduate programs require that applicants take the GRE. Contact the specific program for further information. Applicants who are applying for admission to a department, group, or school which requires that they take the GRE should do so as early as possible to insure the timely receipt of their score results. **Applicants must take the GRE no later than fall in order to meet most departmental deadlines for admission.** Consult the GRE Information & Registration Bulletin or the GRE Web site http://gre.org for further information. Only official scores sent to UCSD by E.T.S. will be accepted for admission.

To facilitate the processing of applications for admission, applicants may forward to their proposed major department, group, or school a copy of their GRE examination score as soon as it is received, since official copies are not always immediately received by the appropriate department at UCSD.

LETTERS OF RECOMMENDATION

Applicants should arrange to have three letters of recommendation submitted online to UCSD. If paper letters are necessary they must be mailed to the prospective major department, group, or school. (Recommendation forms can be printed from the online application site). It is most important that letters of recommendation be completed by individuals in a position to analyze an applicant's abilities and academic or professional promise. Applicants who have applied within the last two years, and were admitted, but did not enroll, should check with their major department or group to determine if letters of recommendation are still on file.

INTERNATIONAL APPLICANT FINANCIAL STATEMENT

Foreign applicants are required to certify that they possess sufficient funds to cover all fees, transportation, and living expenses during the first academic year of graduate enrollment at UCSD. In addition, they must certify as to the probability of funds for subsequent years of study. An International Applicant Financial Statement, for the purpose of indicating the amount and source of funds available for graduate study, is forwarded to foreign applicants upon admission into a graduate program.

A written summary of present and future financial resources must be provided before visa forms can be granted.

Opportunities for employment on or off campus, are extremely limited, and foreign applicants should not base their educational plans on the hope of finding employment after arriving in the United States.

Admissions Examination Information

There are a variety of internationally administered examinations which may be taken to meet requirements for admission to graduate study or to satisfy certain requirements for advanced degrees. Several examinations of importance to UCSD applicants are listed here.

TEST OF ENGLISH AS A FOREIGN LANGUAGE (TOEFL)

All international applicants whose native language is not English and whose undergraduate education was conducted in a language other than English must take the TOEFL and submit their test scores to the Office of Graduate Admissions. Some departments now require the Test of Written English (TWE) as well as the Listening, Structure, and Reading Sections of the TOEFL.

The minimum TOFEL score for admission is 550 for the paper-based test or 213 for the computer-based test. Applicants admitted with low scores may be required to take an English proficiency test upon arrival at UCSD and to enroll in an English course until the required proficiency is attained.

Application: Information and forms are available online at http://toefl.org, or from TOEFL Services, P.O. Box 6151, Princeton, NJ 08541-6151, or from United States embassies, consulates, and related centers.

TEST OF SPOKEN ENGLISH (TSE)

The Test of Spoken English helps foreign students provide a reliable measure of proficiency in spoken English. This test is highly recommended for foreign applicants who wish to be considered for a teaching assistantship. Test information is available at http://tse.org.

Admission and Registration

Official admission to graduate study at the university is contingent upon review of an applicant's record, receipt of final undergraduate transcript showing degree(s) awarded, receipt of official transcripts of all attended institutions, an affirmative recommendation by the prospective department, group, or school, and action by the Office of Graduate Studies and Research. The dean of Graduate Studies or the prospective major department, group, or school may deny admission if an applicant's scholastic record is undistinguished, if the preparation is judged inadequate as a foundation for advanced work, or in the event that no further students can be accommodated for a given quarter. **Only the official Certificate of Admission from the dean of Graduate Studies constitutes formal approval of admission to a graduate program at UCSD.**

Official notification of admission by the dean of Graduate Studies will be mailed well in advance of the beginning of the quarter for which application has been made. Applicants should call their prospective major department, if formal notification is not received four weeks prior to the beginning of the quarter for which they applied.

Admission to graduate standing does not constitute registration for classes. A student is not officially registered for classes until the entire registration procedure is completed each quarter. Information and all necessary registration materials will be available at department offices approximately two weeks before the opening of the quarter (see "Academic Calendar").

Reapplication

Applicants who are admitted but decide not to register in the quarter for which they first apply may request deferral of their application for a later quarter within the same academic year or the academic year immediately subsequent. Application for admission of an approved deferred applicant for the subsequent academic year may be made by submitting a statement of activities and official transcripts of any academic work undertaken since the first application to the department or group. Admission is not guaranteed to previously admitted applicants who have an approved deferral. In no case are application files retained for more than four consecutive academic quarters from the date of first application. Application after this period may be made only by completing a new application and providing all necessary documents, including payment of the graduate application fee.

Students who are denied admission must submit a new application and fee together with required documentation in order to be considered for admission in another academic year.

Readmission

A graduate student whose status has lapsed because of an interruption in registration must petition his or her department for readmission at least eight weeks prior to the first day of the quarter in which reenrollment is intended. **Do not complete an Application for Admission.** Students must submit supplementary transcripts of all academic course work undertaken since last enrolled at UCSD, pay a readmission fee of $40, and complete a General Petition and a supplementary Statement of Activities. In addition, a Statement of Legal Residence is required for all students returning after an absence of two quarters or more.

Readmission is not automatic.

Registration Requirements and Procedures

All students must enroll and pay fees on or before the deadline dates established by the Office of the Registrar for each quarter to avoid paying late fees. Enrollment materials are obtained at the major department. (See Schedule of Classes for current deadlines.)

Full-Time Student

A full-time student is required to be registered for twelve units each quarter of each academic year until the completion of all requirements for the degree, including the filing of the thesis or dissertation.

Part-Time Student

A part-time student is enrolled in fewer than twelve units a quarter but is admitted as a regular student. A part-time student must pay full fees unless approved by the dean of Graduate Studies to enroll in half-time status for six units or fewer.

A student must file the petition for half-time study with the Office of Graduate Studies and Research no later than the last day of the second week of the quarter to be eligible for reduced fees. (See "Admissions Policies-Part-Time Study.")

Schedule of Classes

Detailed information on registration and enrollment procedures is contained in the quarterly *Schedule of Classes*, available for purchase at the University Bookstore before the beginning of the quarter. **It is the responsibility of each graduate student to keep informed of and meet all enrollment and registration (fee payment) deadlines.** Scheduling information may also be found on the Office of Admissions and Records home page on the World Wide Web: http://studentlink.ucsd.edu

Priority Enrollment

CONTINUING STUDENTS

Continuing graduate students may enroll in classes through WebReg or by coming to the Registrar's office any time during the quarterly enrollment period. A Personal Access Code (PAC) number is issued to graduate students by the Office of the Registrar. Students may also use WebReg to add, change, and drop classes. Students who do not use WebReg may complete Add/Drop Cards and file them with the Office of the Registrar any time during enrollment periods.

Complete instructions for enrolling by WebReg or Add/Drop Cards can be found in the quarterly Schedule of Classes and on StudentLink.

Confirmation of classes is immediate by WebReg. Students must officially withdraw from a course to avoid receiving a failing grade.

NEW STUDENTS

New students are given academic advising in their respective academic departments and enroll just prior to or at the beginning of their first quarter at UCSD.

Registration Receipt

Upon payment of fees in person, the Cashier's Office will provide a cash register receipt and will affix a validation sticker to the back of the Student Photo-Identification Card. Students who pay fees by mail may obtain the validation sticker from the Bursar's Office.

Student Photo-Identification Card

A validated Student Photo-Identification Card is the official ID for registered students and entitles the student to library privileges, a student health card, and use of other university facilities, as well as for purchasing tickets and/or admission to certain university events and voting in student body elections.

If the Student Photo-Identification Card is lost, students may obtain a duplicate at the Campus Card Services Office, 508 University Center.

Registration Procedures

Students are considered enrolled when they have requested at least one course and space in it has been reserved. Every effort will be made to enroll students in their preferred class sections. Students are not considered registered until they have both enrolled in classes and paid registration fees.

Payment of Registration Fees

Please refer to the "Payment of Registration Fees" section in the "Undergraduate Registration" portion of this catalog or the quarterly *Schedule of Classes* which outlines procedures for payment of registration fees.

Note to Fellowship, Scholarship, or Traineeship Holders:

The first billing statement will be sent to the major department, group, or school about one month prior to the start of each quarter. Fees and tuition awarded to pay registration fees will be credited to the graduate student's account and appear on the statement as a payment or credit. Each award recipient should carefully check the amounts listed on the statement against the graduate award letter and contact the Office of Graduate Studies immediately at (858) 534-6464 if there is a discrepancy. Graduate students with partial fee and/or tuition awards will be required to pay the balance by the fee deadline to complete their registration.

Fellowship, scholarship, or traineeship holders must enroll in and maintain full-time enrollment status (at least twelve units per quarter).

Note to Students on Academic Titles:

Students appointed 25 percent time or more as graduate student researchers on the tuition and fee remission program will have the amount of their required tuition/fees credited to their account prior to the beginning of the quarter. This payment will also appear on the student's university billing statement.

Students appointed 25 percent time or more as teaching assistants, associates, and readers or, tutors guaranteed by the hiring department to work at least 110 hours (25 percent) for the quarter will have partial fee remission (including remission of the health insurance fee) credited to their university account prior to the beginning of the quarter. Students who are readers and/or tutors who are not guaranteed 25 percent time at the beginning of the quarter, but subsequently work 110 hours or more, are issued refunds for partial fee remission at the end of the quarter.

Teaching assistants appointed 25 percent time or more are eligible to apply for the TA Fee Deferment program. Under this program, the balance of resident fees (but not tuition) is deducted from the second and third check each quarter.

During the fall quarter only, teaching assistants and graduate student researchers appointed 25 percent time or more may be eligible to apply for the TA/RA Loan program.

For additional information, contact your graduate department or the Office of Graduate Studies and Research.

Full-time graduate study and support requires enrollment in a minimum of twelve units each quarter.

Continuous Registration

All graduate students are required to be registered each quarter until all degree requirements have been completed, including filing of the thesis or dissertation and the final examination, or to be on an approved leave of absence.

A student who fails to register or to file an approved leave of absence form by the registrar's deadline date (no later than the end of the second week each quarter) will be assumed to be withdrawn from UCSD and will be dropped from the official register of graduate students. In addition, all outstanding Incomplete grades, and NRs assigned by the registrar, will lapse to F's or U's unless cleared by the end of the current quarter. A student who is on leave of absence or who has withdrawn from the university is not entitled to withdraw books from the library or to use other university facilities or faculty time. A student who is withdrawn must petition for readmission to resume study at a later date, pay the nonrefundable readmission fee, and be consid-

ered for readmission with all others requesting admission to that quarter.

Ph.D. degree candidacy will lapse for graduate students who fail to register and are not granted a formal leave of absence. To be reinstated to candidacy, a graduate student must be readmitted, enroll and register, be readvanced to candidacy, and pay the candidacy fee.

Late Registration/Deadline and Penalty Fees

Students will be assessed late fees if not enrolled and registered by the registrar's published deadlines outlined in this catalog and the quarterly *Schedule of Classes.* Please refer to the "Graduate Admission Information and Enrollment Deadlines" portion of this catalog or to the quarterly Schedule of Classes for additional information.

A student who has not completed registration (enrolled and paid fees) by the deadline for change of program **must petition for permission to register late and will pay late fees totalling $100,** regardless of the source of fees payment.

A student whose registration in classes is cancelled for non-payment of fees and seeks reinstatement will be assessed both the late enrollment ($50) and late registration fees ($50), currently totaling $100, regardless of the source of fees payment.

Students are advised to consult the quarterly Schedule of Classes for current deadline dates.

Changes in Course Selection

Add/Drop Cards reflecting changes in class enrollment must be filed with the Office of the Registrar in order for the student to receive credit for added courses and be relieved of responsibility for dropped courses.

Add/Drop Cards must be completed in full and include correct course information and course codes as listed in the current *Schedule of Classes.*

After enrolling in courses, a graduate student may add courses, change sections of a given course, or change grading options up to the end of the second week of instruction without fee by completing an Add/Drop Card available at the Office of the Registrar. Students may also use WebReg. Students in some programs must obtain approval of their graduate adviser or department. See *Schedule of Classes,* "Changes of Programs." Any requests to the dean of Graduate Studies for exception to this policy require written explanation and instructor verification of attendance/course work completion to date.

A graduate student may drop a class up to the end of the ninth week of classes by filing an Add/Drop Card with the registrar, **after** first notifying the instructor, and obtaining the approval of the graduate adviser or department and the dean of Graduate Studies. If the course is dropped before the end of the fourth week of classes, no course entry will appear on the student's transcript. Courses dropped after the end of the fourth week of instruction and before the end of the ninth week of instruction will remain on the transcript as permanent entries showing course number and title, and the registrar will assign a final grade of W, signifying Withdrawal.

Students may not drop courses after the end of the ninth week of instruction and will receive the earned grade or an Incomplete, if applicable. When a grade in a course has been assigned in accordance with the Academic Senate policy on Integrity of Scholarship, a student may not subsequently change that grade by dropping the course or withdrawing from the university.

Enrollment Limits

A full-time graduate student in a regular quarter is expected to enroll in twelve units of upper-division or graduate course work with the exception that in the Graduate School of International Relations and Pacific Studies the normal course load is sixteen units. A student who wishes to take units in excess of these limits must obtain the approval of the graduate adviser or department chair.

Graduate students holding half-time appointments as graduate student researchers, teaching assistants, language assistants, readers, or other employment titles, or who receive support from traineeships, fellowships, or scholarships paid through the university or directly to the student, must enroll and register for twelve units of upper-division and/or graduate course work and research each quarter.

Teaching units (500 series) above the full-time program of twelve units are not considered an overload.

Graduate students approved for half-time study are limited to a maximum of six units of upper-division or graduate course work each quarter.

Changes of Name or Address

Students must file official change of name or address forms with the Office of the Registrar. Students are advised to also notify their major department, group, or school.

Leave of Absence/Extension

A student who discontinues graduate study with the intention of resuming during a later quarter, with department approval, files a formal Leave of Absence, Extension and/or Withdrawal form prior to leaving the campus. Graduate students must have completed at least one quarter of academic residence and be in good standing (GPA 3.0 minimum or equivalent and no more than eight units of U or F) to be granted a leave. All graduate students are limited to a maximum of three quarters of leave and/or withdrawal.

Prior to the end of the second week of instruction of the quarter in which the leave is to begin, a student must complete a Leave of Absence form and obtain required signatures as listed under the clearance section of the form, and the approvals of the graduate adviser, chair of the (major) department, group, or school, and dean of Graduate Studies. If a student has registered, paid fees and enrolled for the quarter in which a leave is being requested, the validation sticker will be removed from the Photo-Identification Card; **fee refund will be subject to the refund schedule published in the quarterly Schedule of Classes (see section on "Withdrawal").** A graduate student who enrolled in classes before requesting a Leave of Absence must also request a withdrawal from course work for the quarter of leave to avoid paying fees for that quarter. Graduate students may request an extension of an approved leave prior to the expiration of the leave, up to the maximum of three quarters in all degree programs. For an extension of an approved leave, the student must complete a new leave of absence form and obtain the signatures of the graduate adviser, chair of (major) department, housing, and dean of graduate studies.

PARENTING LEAVE

A graduate student who is bearing a child, who has primary responsibility for the care of an infant immediately following birth, a child under the age of five, or adoption of a child under age five, and is in good academic standing will be granted, on request, a one-quarter extension of

all unexpired Ph.D. time limits. During the quarter in which childbirth or adoption occurs, the graduate student may choose one of the following registration options:

1. continue registering as a full-time graduate student and retain eligibility for support
2. reduce to part-time status (less than twelve units) and be eligible for up to 25 percent time employment on campus
3. take a leave of absence

After the quarter in which childbirth or adoption occurs, a graduate student who has primary responsibility for caring for a child up to the age of five will be granted, on request, a leave of absence for the purpose of caring for the child for a maximum of two quarters (or three quarters, if a one-quarter extension has not been granted for the quarter in which childbirth or adoption occurred).

The total amount of time for which graduate students may receive extensions of time limits for parenting or childbearing may not exceed three quarters in a graduate student's career at UCSD. Approved leaves for childbearing and parenting will not count in the three-quarter leave limit available to all graduate students.

A student who has a long-term loan is considered to be out of school while on a leave of absence and **must set up an exit interview with the Loan Records Office before leaving the campus.** Since rules and regulations pertaining to such loans are complex, it is to the student's advantage to determine loan requirements prior to seeking a leave of absence.

A student on leave of absence may not (1) be employed by UCSD, UCSD Medical Center or UC Extension, or hold a fellowship, traineeship, or similar appointment administered by the university, (2) use university facilities, (3) complete a qualifying examination for advancement to candidacy, or (4) place demands on faculty, including discussion of thesis or dissertation work, either directly or by correspondence, during the period of leave.

A student may remain in student housing while on an approved leave of absence providing he or she has been a full-time student (twelve units or more) for three consecutive quarters immediately prior to the leave of absence and is eligible for university housing.

Students must return all borrowed library material if requesting a leave of absence or withdrawing.

Any student on an approved Leave of Absence must contact their major department to be reinstated and cleared for enrollment and registration.

A new Statement of Legal Residence is required for all graduate students **returning from a leave of absence of two quarters or more.**

Withdrawal

A student withdrawing from the university must obtain a Leave of Absence, Extension and/or Withdrawal form and secure appropriate signatures. The approved form must be filed with the Office of Graduate Studies and Research and the validation sticker removed from the Photo-Identification Card.

Students who withdraw during the first thirty-five days of instruction will receive refunds of fees in proportion to the number of *elapsed calendar days since the first day of instruction.* **The date of withdrawal used in calculating the refund shall be the date on which the approved notice of withdrawal is submitted to the Office of Graduate Studies and Research.**

A registered student who stops attending classes and fails to file a Leave of Absence, Extension, and/or Withdrawal form will receive a grade of F or U in each course, thus jeopardizing eligibility for readmission.

Return of Title IV Federal Student Aid

Financial aid recipients may be required to return some or all of their aid at the time of withdrawal. This requirement applies only to undergraduate students who withdraw prior to completing 60 percent of the quarter. Questions about financial aid repayment should be directed to Student Financial Services Office.

Bar from Registration/Nonacademic

After suitable warning, a student may be barred from further registration for a variety of nonacademic reasons, including failure to comply with official notices, to settle financial obligations when due, to provide final undergraduate transcripts, or other related matters.

Bar from Registration/Academic

Academic disqualification is determined by the dean of Graduate Studies in consultation with the student's department, and normally relates to: unsatisfactory academic performance, e.g., failure to maintain a grade-point average of 3.0 or better; failure to meet departmental criteria of performance; failure to advance to candidacy or complete the degree within established time limits; accumulation of more than eight units of F or U grades; or failure to comply with conditions set at the time of admission to a graduate degree program.

Academic Services and Programs

Academic Advising

The college academic advising offices and the academic departments are the designated campus units responsible for providing official academic advice and direction to undergraduate students. The college academic advising offices and departments have primary responsibility for academic advice and services that assist new and continuing students to develop educational plans and course schedules which are compatible with their interests, academic preparation, and educational and career goals.

COLLEGE ADVISING OFFICES

Revelle College, Office of the Provost, Revelle College, Mail Code 0321, (858) 534-3490

John Muir College, 2126 H&SS, Mail Code 0106, (858) 534-3580

Thurgood Marshall College, Admin. Building, Mail Code 0509, (858) 534-4110

Earl Warren College, Literature Building, Second Floor, Mail Code 0422, (858) 534-4350

Eleanor Roosevelt College, Admin. Building, Mail Code 0546, (858) 534-9864

Sixth College, Multipurpose Building, Main Office, Mail Code 0054, (858) 822-5955

Specifically, the college academic advisers conduct academic orientation/enrollment programs for all new students and advise new and continuing students about college general-education and graduation requirements. The advising staff of each college provides general academic and curricular information, clarifies academic rules and regulations, reviews all aspects of academic probation, monitors academic progress, assists students with decision-making strategies, and provides information about major prerequisites as well as criteria for departments that screen students. In conjunction with the academic departments and the Office of the Registrar, the advising offices certify graduation and generally facilitate students' academic adjustment to the university.

Moreover, academic advisers are available to counsel students about educational alternatives, selection of courses and majors, program changes, new academic opportunities, and special programs such as exchange programs, honors programs, outreach programs, etc.

See your college academic adviser for assistance with academic concerns or referral to appropriate academic support units.

Academic Computing Services

User Support Office
2113 Applied Physics and Mathematics, Muir College
(858) 534-4060

Administration and Director's Office
1141–1161 AP&M
(858) 534-4050
http://acs.ucsd.edu/

Academic Computing Services (ACS) plays a variety of roles relating to computing at UCSD. Among these are support of instructional computing, management of the main academic computer network, hardware repair, and administration of site agreements for the licensing and distribution of software.

Student Computing

The main function of ACS is to provide facilities for instructional computing. In addition to timesharing systems ACS maintains over 1800 workstations of various types available across campus. These include Windows, Macintosh, and UNIX workstations located in public areas, computer labs, and libraries.

A wide variety of software is available on various platforms, including general word processing, spread sheet and Web site design applications; compilers and program development tools; special purpose packages for electronic design, mechanical engineering, animation, statistics, genetic studies, and symbolic mathematics.

Beyond instructional computing, ACS provides facilities to students for popular activities such as electronic mail and other network-based communications. Incoming students receive personal account information at Orientation.

ACS has student assistants who are available at scheduled times in computer labs to help students use the facilities. These assistants complement other forms of support such as guidance from instructors and teaching assistants, and online documentation.

ACS provides both instructional and extracurricular computing services to students through a single "personalized" account. The goal is to make computing more convenient and flexible, and to allow students to pursue academic computing interests on their own initiative.

Network Management

The Office of Network Operations is a branch of ACS. Network Operations plays a major role in the management of campus computer networks and services, including the student residential network (ResNet), the campus wireless network, a dial-in modem service, Web proxy, Internet connectivity, Active Directory, the campus email gateway, and an email registry of campus members and affiliates.

Students can obtain more information about ResNet at http://resnet.ucsd.edu and can obtain support at that Web site or by calling (858) 822-2800.

Wireless access is available in most campus buildings and common spaces. A UCSD network login and a wireless network card are required to attach to the network. For more information, students should see http://resnet.ucsd.edu (Wireless Access).

To use campus dial-in lines, UCSD users must sign up and pay for dial-in service. Users will also need a network security username and password. Incoming students have these issued automatically; others may register by bringing a picture ID to the Office of Network Operations in room 2113 AP&M. Signups for dial-in service may be made at this location or via the Web at http://www-no.ucsd.edu.

Network Operations can assist you in connecting your computer to make use of Internet services using electronic mail and mailing lists. Information about many of these services can be found on the World Wide Web at http://www-no.ucsd.edu.

Network Operations Access Services is located in 2113 AP&M. The Network Operations technical help line is (858) 534-1857 or userserv@ucsd.edu. Dial-in billing questions may be directed to (858) 822-2900.

Software Licensing and Distribution
http://software.ucsd.edu

ACS manages agreements with several software vendors under which UCSD departments are able to license and obtain software at a discount.

Desktop Support
(858) 822-0047
http://desktop.ucsd.edu

The ACS Desktop Support Program provides assistance on a fee-for-service basis to UCSD departments, as well as to residence hall customers. Services include installation, configuration, and repair of Windows and Macintosh workstations; Windows and Novell Netware server support. For more information, email desktop@ucsd.edu.

Instructional WWW Development Center
(858) 822-3315
http://iwdc.ucsd.edu
http://courses.ucsd.edu

ACS' Instructional WWW Development Center (IWDC) provides instructional Web site creation, development assistance, and training for faculty. The IWDC offers more extensive services on a recharge basis, including departmental and UCSD-affiliated group Web hosting and fee-for-service Web-related programming. For more information, email iwdc@ucsd.edu.

Computer Repair and Installation
(858) 534-4057
http://cri.ucsd.edu

Computer Repair and Installation provides computer and printer maintenance and repair for over 1800 workstations and printers in various labs across campus including network installation and support. ACS Computer Repair and Installation also provides the UCSD community with expert hardware repair and upgrade support. They have professional certified full-time staff with extensive combined repair service and upgrade support. They repair and upgrade most computer and printer products and are available for network installation and repair. Their goal is to provide UCSD faculty, staff, and students with an efficient and cost effective solution for all their computing needs.

Other ACS Functions

ACS operates one UNIX system which is available on a fee-for-service (recharge) basis. This system is primarily used by UCSD academic departments for electronic mail and administrative purposes. ACS also has a service to distribute campus administrative data to academic departments.

Academic Enrichment Programs/Student Educational Advancement/Student Affairs

University Center 411
Mail code 0074
(858) 534-1774

Dedicated to providing UCSD undergraduates with research and other academic enrichment experiences beyond the classroom.

PROGRAM DESCRIPTIONS:

Faculty Mentor Program

The Faculty Mentor Program offers valuable research experience to juniors and seniors who want to prepare for graduate or professional school. Participants work as research assistants to UCSD faculty members for at least ten hours per week for two quarters. Students receive four units of 199 independent study credit each quarter, attend seminars on how to write and present a research paper, and receive graduate school and fellowship information. At the conclusion of the program, students present their research papers at the annual Faculty Mentor Program Research Symposium.

Health and Medical Professions Preparation Program

HMP^3 assists students in their undergraduate preparation for careers in the health professions. These include medicine, dentistry, pharmacy, veterinary, public health, nursing, and others. The program provides students with activities and resources including preprofessional seminars, review course scholarships, volunteer placement information, peer discussion series, and mentorship opportunities. Participants have access to a library of information on summer and postbaccalaureate programs, upcoming conferences, health professional schools, etc. The program also serves as a clearinghouse for information about other campus resources available to the prehealth professional student.

Summer Research Program

The Summer Research Program offers a paid full-time research experience to students who are interested in preparing for careers in research or university teaching. As research assistants, students work on their faculty mentor's projects for at least thirty hours per week. Students are trained in research skills, how to write and present a research proposal or paper, and how to prepare for the Graduate Record Examination (GRE). At the conclusion of the program, students present their papers at the annual UCSD Summer Research Conference.

McNair Program

The McNair Program is a U.S. Department of Education initiative designed to serve low-income, first-generation college students and underrepresented minorities who are interested in pursuing a Ph.D. It is a rigorous one-year program of scholarly activities that includes participation in the Faculty Mentor Program and the Summer Research Program. In addition, participants receive training in how to write and present a scholarly paper, preparation for the GRE, and assistance with the graduate school application process. All participants have the opportunity to present a paper at a minimum of two research conferences.

CAMP Science Program

The CAMP Science Program is funded by the California Louis Stokes Alliance for Minority Participation in Science, Engineering and Mathematics (CAMP) grant from the National Science Foundation. This program is designed to provide support and advancement opportunities to ethnically underrepresented students who are seeking bachelor's degrees in the sciences, mathematics, engineering, and technology. Participants in this program may attend informational and skill-building workshops, tour UCSD laboratories, local companies and research institutes, attend local and/or national conferences, participate in a book exchange program, attend study break dinners and coffee with faculty events, and are eligible to earn book scholarships. In addition, students are encouraged to participate in academic year and/or summer research, and pursue graduate school preparation.

Computer Science, Engineering, and Mathematics Scholarship (CSEMS)

The Computer Science, Engineering, and Mathematics Scholarship (CSEMS) is a two- or four-year program providing research and outreach opportunities to low-income, academically talented students in the Jacobs School of Engineering and the Department of Mathematics. The

chief objectives of the program are to promote full-time enrollment and degree completion.

University of California Leadership Excellence through Advanced Degrees (UC LEADS)

The University of California Leadership Excellence through Advanced Degrees (UC LEADS) is a selective two-year research program for undergraduates majoring in science, engineering, or mathematics. Students receive stipend support for two summers of research and support for travel to conferences, membership in professional associations, and other research-related activities. UC LEADS participants work on well-defined projects under the supervision of faculty mentors. The UC LEADS experience will prepare students to be competitive applicants for admission to doctoral programs, preferably within the UC system, and eventually to assume leadership positions in society.

Undergraduate Research Conference

The UCSD Undergraduate Research Conference is an annual event where more than 100 students who have written outstanding research papers are invited to present their research. Invitation is by faculty nomination. Students present their papers at small roundtable discussions led by a faculty presider.

Education Abroad Program (EAP)

International Center (corner of Gilman Drive and Library Walk)
Mail code 0018
(858) 534-1123
http://www.ucsd.edu/icenter

The Education Abroad Program provides students enrolled at the University of California an opportunity for an intercultural experience at UC centers located in Australia/New Zealand, Africa, Asia, Europe, Latin America, and North America, while allowing normal progress toward a degree.

The program is described in detail in the "Courses, Curricula, and Programs of Instruction" section of this catalog under the "Education Abroad" heading.

International Scholar Adviser

International Center (corner of Gilman Drive and Library Walk)
Mail code 0018
(858) 534-3730
http://www.ucsd.edu/icenter

The international scholar adviser provides assistance to UCSD's international faculty, researchers, and post-doctoral fellows, in the areas of immigration and visa matters, financial, health, and personal issues. The adviser also informs campus departments about regulations and documentation pertaining to international visitors. The Friends of the International Center provide additional hospitality services and programs to international scholars and their family members.

International Student Adviser

International Center (corner of Gilman Drive and Library Walk)
Mail code 0018
(858) 534-3730
http://www.ucsd.edu/icenter

The international student adviser provides assistance to UCSD's nonimmigrant undergraduate and graduate international students, including advising on immigration, financial, health, and personal matters. The international student adviser also coordinates campus programs such as orientation and check-in for new students, and provides support to international student organizations.

OASIS (Office of Academic Support and Instructional Services)

3rd Floor, Center Hall
Mail code 0045
(858) 534–3760

The Office of Academic Support and Instructional Services (OASIS) provides a variety of services to maximize student performance and retention at the University of California, San Diego.

MISSION

The mission of OASIS is to assist UCSD students in reaching their full potential by developing an appreciation for learning. OASIS strives to facilitate learning by concentrating on learners, and supporting their academic, intellectual, and personal growth at UCSD. Services are designed to assist students to develop the academic skills to excel in their subject matter at UCSD and eventually in graduate or professional school.

SERVICES

A description of services offered each quarter is available at the OASIS office on the third floor of Center Hall. All students in any of the five colleges are eligible for OASIS services. Underrepresented students are strongly encouraged to use OASIS services in order to maximize their valuable contribution to UCSD.

The Academic Transition Program

The Academic Transition Program coordinates a residential Summer Bridge Program and professional and academic transition counseling for freshmen at UCSD. A variety of academic support and personal development activities are offered to facilitate a smooth transition from high school to UCSD's fast-paced quarter system.

The Math and Science Tutorial Program

The Math and Science Tutorial Program is designed to support students in their desire to excel in mathematics and science courses. The program offers workshops for mathematics, physics, biology, chemistry, engineering, and economics courses.

The Language Program

Students whose first language is not English are assisted in the Language Program. In addition, students doing academic work in Spanish, French, and other foreign languages can participate in Language Program tutorial sessions conducted by bilingual staff. Language Program services include group or individual intensive reading and writing sessions, workshops on grammar and mechanics, and individual conferences where feedback on drafts of writing in the languages is provided.

The Student Support Services Program

The Student Support Services Program is a comprehensive U.S. Department of Education initiative designed to support the academic efforts of participating students. The program seeks to maximize the achievement and development of eligible students, particularly those who have been traditionally underrepresented due to race or ethnicity, gender, disability, and/or economic status. Student Support Services also strives to enhance each program participant's eligibility for entrance to graduate and professional schools and to foster an institutional climate which will support the success of program participants. The program consists of intensive individual tutoring, professional counseling, peer mentoring, and various cultural enrichment activities.

Study Management Program

The Study Management program equips students with strategies and techniques for more efficient and enjoyable learning. Study strategies

are provided for freshmen, transfer, and continuing UCSD students with a focus on undergraduates. Study Management Program staff assist students in developing and/or refining skills in areas including time management, active listening, note taking techniques, forming/conducting study groups, concentration/memory development, active reading techniques, test preparation, and exam strategies. Services are provided through workshops and individual conferences with peer tutors or professional staff.

The Research and Evaluation Program

Administered jointly by the Office of the Assistant Vice Chancellor for Student Educational Advancement and OASIS, the Research and Evaluation Program maintains data about students using OASIS services and conducts research projects which examine a particular problem or issue related to OASIS services. In addition, longitudinal studies of the effect of services on student users are undertaken, such as follow-up studies on the retention of Summer Bridge students. Evaluation activities that are essential to the provision of effective services to students are also the responsibility of this program.

TEP 116–The Psychology of Teaching

OASIS offers a four-unit, upper-division course that provides instruction to all OASIS student staff members on the teaching-learning process. The course is designed to balance lectures and readings with supervised, practical experience.

Office of International Education

International Center
(corner of Gilman Drive and Library Walk)
Mail code 0018
(858) 534-3730
http://www.ucsd.edu/icenter

The International Center houses the offices of the international student and scholar advisers and advisers for the Education Abroad Program and the Opportunities Abroad Program, as well as the Programs Abroad Resource Library. In addition, the center has American English tutors available to international students, scholars and spouses, and houses the office of all the community volunteers who provide a wealth of hospitality programs to international students, scholars, and spouses, including language tutors and host families.

The staff and community volunteers as well as the International Club also sponsor a variety of international/intercultural programs and services for all members of the UCSD community. These include lectures, language exchanges, linkages with international faculty specialists, and weekly international cafe lunches which are open to the entire campus.

Opportunities Abroad Program (OAP)

International Center (corner of Gilman Drive and Library Walk)
Mail code 0018
(858) 534-1123
http://www.ucsd.edu/icenter

The Opportunities Abroad Program (housed in the Programs Abroad Office, along with the Education Abroad Program) facilitates participation in programs abroad sponsored by institutions other than the University of California. OAP offers a resource library and advisory services enabling UCSD students to choose study, work, internship, and educational travel abroad programs best suited to their individual needs. Programs are available for students in all majors, for periods ranging from a quarter to a full academic year. Students participating in approved academic programs abroad transfer credit back to UCSD. They receive assistance with this as well as application, financial aid, predeparture, and re-entry issues through the OAP. Special study abroad scholarships are also available. Students participating in non-academic programs generally do not earn credit but in some instances may arrange to do so, for example, through the Academic Internship Program.

San Diego Supercomputer Center (SDSC)

Mail code 0505
(858) 534-5000 (general inquiries)
(858) 534-5100
www.sdsc.edu

The San Diego Supercomputer Center (SDSC) is an organized research unit of UCSD focusing on computational science and engineering research. The mission of its staff of 400 scientists, software developers, and research, operations, and user support staff is to innovate, develop, and deploy technology that enables and facilitates the next generation of scientific advances. Since its inception in 1985, SDSC has served more than 10,000 researchers at 300 academic, government, and industrial institutions in the United States and abroad. These researchers use SDSC high performance computing resources to study problems in many scientific areas and to investigate new paradigms of computing. Areas of effort include:

- capability computing—providing computing and information resources of exceptional capability to enable scientific discovery at scales not previously achievable
- discovery environments—developing and deploying integrated, easy-to-use computational environments to foster scientific discovery in traditional and emerging disciplines

SDSC was founded in 1985 with a $170 million grant from the National Science Foundation's Supercomputer Centers program. In October 1997, SDSC extended its leadership in computational science and engineering to form the National Partnership for Advanced Computational Infrastructure (NPACI), teaming with approximately 40 university partners around the country. Since 2001, NPACI collaborated with four partners—the National Center for Supercomputing Applications at the University of Illinois, Argonne National Laboratory, and the Center for Advanced Computing Research at the California Institute of Technology, and the Pittsburgh Supercomputing Center—on an $88 million, multi-year effort to build the TeraGrid, (http://www.teragrid.org), which is the world's most powerful and most comprehensive, distributed computational infrastructure for open scientific research.

Through the NPACI and TeraGrid programs and other high performance computing initiatives, SDSC engages in:

- conducting and fostering scientific research (see "Research at UCSD")
- broadening the impact of computational science and engineering through education, outreach, and training activities
- expanding the existing infrastructure to data-intensive computing that enables management, curation, analysis, and visualization of huge amounts of data
- integrating high performance computational technology into commercial research, design, and manufacturing processes through partnerships with industry.

Current technology thrusts for SDSC and its NPACI partners include grid computing, programming tools and environments, data-intensive

computing, and interaction environments. Applications thrusts are molecular science, neuroscience, Earth systems science, and engineering. Each project teams applications and technology developers, and involves representatives from multiple partner sites. This infrastructure is being developed further through partnerships with computer vendors and companies with high-performance computing applications.

The demanding research problems that are being tackled by scientists using SDSC's high performance computing power include: understanding the origin of the universe, modeling supramolecules of more than one million atoms, determining chemical reaction rates, designing new materials, simulating the human nervous system, modeling water and pollutant transport underground, and modeling climate and predicting storms.

COMPUTATIONAL RESOURCES

NPACI funding along with grants from the NSF, NIH, and other sources keep SDSC's computational resources at the state of the art and support a variety of software development projects led by faculty and staff members. SDSC computational resources include the following:

- DataStar is a 10.4 teraflops supercomputer with total shared memory of 4 terabytes. DataStar is among the 20 top supercomputers in the world and targeted at large-scale, data intensive scientific research applications.
- Under the TeraGrid program, SDSC operates two large IA-64 based clusters with a total peak speed of 4 teraflops. These systems are part of the national TeraGrid system with our partners, which is connected to the other national TeraGrid partners by a 40 Gbps cross-country backbone network.
- SDSC continues to operate Blue Horizon, a 1,152-processor IBM SP capable of 1.7 trillion calculations per second.
- SDSC has more than 540 terabytes of online disk storage as well as 6 petabytes of archival tape storage, one of the world's largest data storage installations.
- Meteor is a Linux cluster with 200 Intel processors, the biggest Linux/Intel cluster on campus. Meteor is devoted to UCSD research.
- Sun Enterprise SunFire 15000 is a 72-processor system with 288 GB memory attached to SDSC's storage area network.
- RockStar is a 128-node Sun Fire V60x supercomputer used for cluster management research.
- A visualization laboratory features advanced display systems, facilities for producing solid 3-D models of geometric data sets, and a suite for producing professional-quality videotapes of visualized research results.

RESEARCH ALLOCATIONS, RESOURCES, AND SUPPORT

UCSD faculty and students are eligible for allocations of time on SDSC's supercomputers and other NPACI resources. Undergraduate and graduate students may obtain time through applications submitted by their advisers. Such allocations should support research projects or class curricula. All proposed projects must be nonproprietary. To apply for time, applications must be submitted at least sixty days prior to the quarter in which the allocation is to begin (quarters begin January 1, April 1, July 1, and October 1; allocations are typically made for twelve-month periods). Applications for relatively small amounts of time can be submitted any time and are reviewed shortly after receipt (www.npaci.edu/Allocations).

The Academic Associates Program, formerly known as the Block Grant Program, was started in 1995 to give University of California (UC) researchers access to computational resources at the San Diego Supercomputer Center (SDSC). Any UC researcher can request supercomputing time online at http://www.sdsc.edu/aap.html. Resources include free supercomputer time, high-performance storage, software and technical support including training and workshops. Administrators are available at each UC campus to help researchers with any questions or problems they may have regarding the Academic Associates Program. For more information, contact Natasha Balac, AAP program liaison, at natashab@sdsc.edu or (858) 534-5161.

Accounts also are available on workstations in SDSC's VisLab to any academic researcher, undergraduate, or graduate student. To apply, fill out the SDSC Workstation Access Request form, which is available from Rachel Chrisman, chrisman@sdsc.edu, (858) 534-5025. Each form is reviewed to ensure that the goals of the applicant are consistent with the mission of SDSC. This review process takes two to four weeks.

Researchers with access to SDSC's resources are supported by SDSC's consulting staff and other staff at the University of Texas and the University of Michigan. SDSC consultants are available through the Web (www.npaci.edu/Consult) 5 a.m.–5 p.m. (Pacific Time), Monday–Friday. Researchers and students with accounts are welcome to attend SDSC's periodic training workshops, which usually are free (www.npaci.edu/Training).

ADDITIONAL OPPORTUNITIES FOR THE CAMPUS COMMUNITY

SDSC offers the following additional opportunities for UCSD faculty, staff, and students:

- Access to high-performance computers through UCSD classes—Many UCSD classes make use of the SDSC resources, providing a hands-on way to learn about high-performance computing. Check class listings for biology, chemistry and biochemistry, computer science and engineering, mechanical and aerospace engineering, Scripps Institution of Oceanography, and UCSD Extension.
- Seminars—SDSC hosts a wide variety of seminars on topics of interest to the high-performance computing and computational science community. Most are open to the UCSD community (www.sdsc.edu/CSSS).
- Publications—SDSC publishes a science magazine, EnVision; a monthly electronic newsletter, and other documents and reports. All are free to the campus community. For subscriptions, please contact Gretchen Rauen, gretchen@sdsc.edu, (858) 534-5111.
- Internships—Students can obtain work experience at SDSC for course credit through the academic internship program at UCSD. SDSC has internships in systems software development, computational science research, visualization and applications programming, scientific and technical writing, and curriculum development. For more information, contact Rozeanne Steckler, steckler@sdsc.edu, (858) 534-5122.
- Part-time and full-time employment—SDSC posts part-time and full-time professional job openings at the UCSD Career Services Center. Typical jobs are in research programming support, scientific writing, computer operations, and reception work.
- Tours—SDSC offers a 45-minute tour for the public conducted by the operations department at 4 p.m. the first Friday of every month. Reservations are recommended and can be made by contacting the reception desk, (858)

534-5000. Special-interest tours for education and industry groups can be arranged by contacting April Bailey at tours@sdsc.edu.

Additional information about SDSC can be obtained from the SDSC and NPACI Web sites (www.sdsc.edu and www.npaci.edu) or by calling SDSC at (858) 534-5000.

UCSD Extension–Extended Studies and Public Programs

extension.ucsd.edu
UCSD Campus
9600 North Torrey Pines Road
Mail code 1076H
(858) 534-3400
email: unex-reg@ucsd.edu
fax: (858) 534-8527

UCSD Extension is an innovator in providing lifelong learning solutions for the San Diego community and abroad. Through networking forums, technology-focused programs, and cutting-edge education, UCSD Extension has inspired an unstoppable creative community; provided early awareness of emerging business trends; and educated one of the most competitive workforces in the world.

Course work may be pursued year-round at three San Diego locations, online, and overseas. Choose from a variety of learning formats including individual classes, certificates, signature programs, lecture series, workshops, institutes, and conferences. The majority of Extension's students hold bachelor's degrees while an increasing number have advanced degrees including M.S., Ph.D., J.D,. and M.D. UCSD students, in particular, find Extension's "real-world" curricula highly valuable in supplementing their studies.

Complementing its state-of-the-art classes, UCSD Extension supports a series of strategic programs designed to improve the region's economy through entrepreneurial development, public forums, and civic roundtables. By tapping into Extension's many networks, participants quickly benefit from local innovation and global reach.

Our resources are yours: Explore our website to learn more.

CONTINUING EDUCATION: AREAS OF STUDY — EXTENSION.UCSD.EDU

ART, MUSIC, AND PHOTOGRAPHY

Courses and workshops offered in Abstract Painting, Book Arts, Drawing, Black and White Photography, Digital Photography, Singing, Guitar, and Piano. For more information, call (858) 964-1051.

BASIC SCIENCES AND MATH

Courses offered in Biochemistry, Molecular Biology, Organic Chemistry, Biostatistics, Cancer Biology, Neurobiology, Computer Science, Ocean Engineering, and Calculus. For more information, call (858) 964-1347.

BEHAVIORAL HEALTH AND COUNSELING

Courses and workshops offered in Alcohol and Drug Abuse Counseling, Geriatric Activity Programs, Gerontological Information and Assistance, Art Therapy, Play Therapy, and Multicultural Counseling. For more information, call (858) 964-1070.

BIOTECH AND PHARMECEUTICALS

Courses and intensive programs offered in Computer Aided Drug Design, Medicinal Chemistry, Computational Biology and Bioinformatics, Drug Discovery and Development, Regulatory Affairs, Quality Assurance and Control, Biotechnology Manufacturing, Proteomics, Microarrays, and Biomedical Product Development. For more information, call (858) 964-1347.

BUSINESS

Courses offered in Accounting, Business Management, Communication, Enterprise Management, Facilities Management, Finance, Fraud Examination, Fundraising and Development, Human Resources Management, International Business, Marketing, Meeting Management, Project Management, Purchasing and Supply Management, Real Estate, and Urban Planning. If you are a full time student, consider the Undergraduate Certificate in Business or the graduate-level certificate in Technology Business Creation. For more information, call (858) 882-8010.

DIGITAL ARTS AND MEDIA

Courses offered in Computer-Aided Design, Graphic Design, Internet and Web Technologies including XHTML, JavaScript, PHP and PERL, and Multimedia. An eighteen-month daytime program is also available focusing on digital design, web development, multimedia, marketing practices, and portfolio creation. Job placement and internships available. For more information, call (858) 622-5739.

EDUCATION

State-approved credential programs offered in Adult Education/Vocational Education, as well as state-approved certificate programs in Cross-Cultural Language and Academic Development (CLAD), and Education of the Gifted and Talented (GATE). Certificate programs and supplementary authorizations are offered for Teaching English as a Second Language (TESL) and Educational Technologies. Additional certificates are Community College Instructor, Educational Therapy, Developmentally Appropriate Practices, and Teaching Mathematics. For more information, call (858) 964-1063.

ENGINEERING

Courses offered in Communications Engineering, Wireless Communications, RF Engineering, Network Technologies, Embedded Computer Engineering, Systems Engineering, VLSI Digital Design, Biomedical Product Development, CDMA Engineering, Lean Enterprise, Open Source Engineering, Thermoplastic Injection Molding, SensorNets and Six-Sigma Black Belt. For more information, call (858) 605-0110.

ENGLISH LANGUAGE PROGRAMS (FOR INTERNATIONAL STUDENTS)

Courses and workshops offered in Academic Writing, Intermediate Business Writing for Non-Native Speakers, Conversation Improvement, Grammar/Vocabulary Building, Pronunciation & Fluency and Accent Reduction. For more information, call (858) 534-0049.

FOREIGN LANGUAGES AND TRAVEL STUDY

Courses offered in Arabic, Chinese (Mandarin), French, German, Italian, Japanese, Korean, Persian, Portuguese, Russian, and Spanish, including Translation and Interpretation. For those seeking to "live the language," students may travel abroad for language immersion programs in more than five countries. For more information, call (858) 964-1051.

HEALTHCARE

Courses offered in Clinical Trials, Medical Procedural Coding, Emergency Department Nursing, Childbirth Education, Diabetes Education, Case Management, Legal Nurse Consulting, Fitness Instruction, and Exercise Science. For more information, call (858) 964-1010.

HUMANITIES AND WRITING

Courses offered in History, Politics and Culture, Conflicts of Religion with Science, Screenwriting, Writing the Short Story, Expository Writing in the Workplace, Information Design for Critical Thinkers, Copyediting, Feature Writing, and Technical Communication. Every quarter, The Revelle Forum at The Neurosciences Institute offers an innovative series of lectures, readings, and public interviews with leading figures from the worlds of arts and culture, literature, current events, and the media. Speakers have included David Rockefeller, Calvin Trillin, Dava Sobel, and Scott Turow. For more information, call (858) 964-1051.

LAW

Courses offered in Bankruptcy Law, Domestic Relations Law, Civil Litigation, Evidence Law, California Litigation Procedures, Law Office Technology, Intellectual Property, and Professional Practice Administration. For more information, call (858) 882-8010.

LEADERSHIP AND MANAGEMENT DEVELOPMENT

Courses and workshops offered in Biotech Business Development, Business Plans, Financing a Start-Up, Validating Market Demand, Executive Knowledge Management, Organizational Dynamics, IT Governance, Business Process Optimization and ERP Essentials, Six Sigma and Lean Enterprise. Advanced programs for astute, broadly educated managers include the Executive Program for Scientists and Engineers (EPSE), The Leadership and Management Program for Technology Professionals (LAMP), Principals Executive Program (PEP), Healthcare Executive Leadership Program (HELP), CONNECT Entrepreneur Development, UCSD Athena, and the UCSD Summer School in Innovation and Entrepreneurship. For more information, call (858) 882-8010.

OCCUPATIONAL HEALTH AND SAFETY

Courses offered through the OSHA Training Institute in Occupational Safety in General Industry and Construction, Hazardous Materials, Respiratory Protection, Fall Arrest Systems, Industrial Hygiene, and more. A professional certificate in Occupational Health and Safety is also available. For more information, call (858) 605-0109.

TECHNOLOGY

Courses offered in Data Management and Analysis and IT and Software Engineering including Data Warehousing, Biological Database Design, Data Modeling, Oracle, Microsoft Access, Microsoft Certification, Networking, BioJava, Perl for Bioinformatics, C/C++, Java, Visual Basic, Security, Software Engineering, UNIX/Linux, Web Services, and .NET. For more information, call (858) 622-5740.

HOW TO ENROLL

Online: extension.ucsd.edu
By phone: (858) 534-3400

In person:
La Jolla
9600 N. Torrey Pines Road, Bldg. C
La Jolla, CA 92093
(858) 534-3400

North County
Carmel View Office Plaza
15373 Innovation Drive
Carmel Mountain Ranch, CA 92128
(858) 451-7474

Sorrento Mesa
AT&T Wireless Building
6925 Lusk Blvd.
San Diego, CA 92121
(858) 882-8000

Concurrent registration: Permits individuals who are not officially matriculated UCSD students to enroll for credit in regular UCSD courses. Offered on a space-available basis with the approval of the course instructors. For more information, call (858) 534-3400.

Complimentary enrollment: UCSD Extension offers a limited number of complimentary enrollments to full-time UCSD students who may enroll in one free course of up to $270 (students must pay anything over that amount) on a first-come, first-served basis. For more information, call (858) 534-3400.

PUBLIC PROGRAMS: In the Community

Academic Connections
www.academicconnections.ucsd.edu

Academic Connections provides students with access to the resources of a research university. This program gives motivated students the opportunity to explore different fields of study, pursue their interests, and better prepare for a university experience. A combination of summer residential programs, year-round academies, and distance education courses will extend the reach of the University, better serving the San Diego community and beyond.

Border Health Education Network
www.extension.ucsd.edu/borderhealth

The Border Health Education Network provides education and training services for healthcare professionals based in the binational California and Baja California region. The Border Health Education Network works closely with the San-Diego Tijuana Border Initiative, the UCSD School of Medicine and UCSD Medical Center, San Diego Dialogue, State of California Office of Border Health, as well as many other organizations, hospitals, and healthcare groups throughout the border region.

Global CONNECT
www.connect.org/globalconnect/

Global CONNECT is a dynamic collection of international organizations working together to develop high-technology and life science linkages. The network will extend partnering opportunities across national borders, offering globally minded entrepreneurs and firms the resources needed to accelerate technological- and science-based enterprises.

Helen Edison Lecture Series
www.helenedison.ucsd.edu

The Helen Edison Lecture Series presents free public lectures on issues advancing humanitarian purposes and objectives. Past speakers have included John Kenneth Galbraith, Naom Chomsky, Luis Valdez, Toni Morrison, Carlos Fuentes, and Robert McNamara.

San Diego Dialogue
www.sandiegodialogue.org

San Diego Dialogue advances solutions to our cross-border region's challenges in economy, environment, and equity. The goal is to improve this region's quality of life through cross-border development, smart growth, and school reform.

UCSD Civic Collaborative
www.ucsd-civic-collaborative.org

The UCSD Civic Collaborative is designed to encourage a two-way flow of knowledge between members of UCSD and the San Diego region. The collaborative sponsors forums, conferences, and informal gatherings to help UCSD researchers become more knowledgeable about San Diego and to direct their best thinking toward understanding and improving the quality of life.

UCSD CONNECT
www.connect.org

UCSD CONNECT is the globally recognized, university-based organization fostering entrepreneurship in the San Diego region by accelerating the growth of technology and life science-based companies. Part of UCSD, CONNECT offers valuable insight and expertise to San Diego's tech community by teaming up with the region's most prominent organizations and by partnering with world-class resources, such as the School of Medicine, Jacobs School of Engineering, San Diego Super Computer Center, and Scripps and Salk Institutes.

UCSD Economics Roundtable
www.econ.ucsd.edu/roundtable

The UCSD Economics Roundtable is a forum for more than 2,000 San Diego business and community leaders to exchange ideas and information with world class economists and financial experts. The UCSD Economics Roundtable has hosted several prominent guests including Ben Bernanke, Board of Governors of the Federal Reserve System, and Robert Shiller, professor of economics at Yale University.

UCSD Institute for Continued Learning (ICL)
www.icl.ucsd.edu

The Institute for Continued Learning (ICL) rekindles the zest for life for retired San Diego professionals. ICL is a membership organization that inspires conversations between interesting people about stimulating topics, offering twenty different programs each quarter. Subjects include archaeology, science, tai chi, computing, live musical performances, literature, foreign languages, and master courses and lectures from UCSD faculty members.

UCSD-TV
www.ucsd.tv

UCSD-TV, the only broadcast television station operated by the University of California, is an Emmy Award-winning, non-commercial station that extends the resources of the university to the greater San Diego community and partners extensively with regional civic, cultural and arts institutions in programming. UCSD-TV broadcasts on UHF Channel 35, Cox Communi-cations, and Time Warner Cable. Programs from UCSD-TV and other University of California campuses are broadcast nationwide on UCTV and on demand.

MORE ON UCSD EXTENSION

Also see UCSD Extended Studies and Public Programs under "Campus Resources."

The UCSD Libraries

http://www.ucsd.edu/libraries

The UCSD Libraries include the Arts Libraries (Art and Architecture Library, Film and Video Library, Music Library), the Biomedical Library, the Center for Library & Instructional Computing Services (CLICS), the Center for Magnetic Recording Research Library (CMRR), the International Relations and Pacific Studies Library, the Mandeville Special Collections Library, the Medical Center Library, the Science and Engineering Library, the Scripps Institution of Oceanography Library, and the Social Sciences and Humanities Library.

COMBINED UCSD LIBRARIES STATISTICS, 2003

Volumes	2,953,024
Periodical and other serial publications received	
Paper	17,711
Electronic	10,735
Graphic materials	339,084
Maps	220,701
Microforms	3,121,676
Audio and video materials	110,705
Slides and other pictorial items	316,233
Computer files	20,768

The Libraries serve as centers for study, reading, and scholarship at UCSD. Their collections and services are basic resources supporting undergraduate and graduate instructional programs, as well as advanced research. The library units are organized and staffed to meet these academic objectives. While each library may have varying rules, all are open to all members of the UCSD community.

Reference services are available at each of the campus libraries and are designed to assist students and faculty with their course needs and research activities. Through their Instruction and Outreach Programs, the Libraries offer campus users a variety of orientation and instructional opportunities. The Contemporary Issues 50 course (Information and Academic Libraries) of Muir College is one example. Group tours of the libraries can be arranged through the reference librarians.

The Interlibrary Loan Service locates and borrows materials not held at UCSD. This service is available to all faculty, staff, and students of the university. Our students enjoy direct borrowing privileges at the other UC campuses.

InfoPath is a World Wide Web-based campus-wide information system developed by UCSD Libraries to provide access to campus and community electronic resources as well as a gateway to the resources of the Internet. Services and resources currently offered through InfoPath include extensive library resources such as ROGER (UCSD Libraries catalog); MELVYL®/ California Digital Library (the University of California systemwide catalog, indexes, and full-text databases), and links to research resources on the Internet. A wide variety of other information about the campus is available through InfoPath, and new resources are added continually. The InfoPath URL is http://www.ucsd.edu.

Library hours of service vary and are regularly posted in the libraries and on InfoPath. Most units extend hours during examination periods.

Note: Call (858) 534-3336 for an up-to-date schedule of open hours for all libraries (recorded message).

ART AND ARCHITECTURE LIBRARY

West Wing, Geisel Library
Mail code 0175F
(858) 534-4811

The Art and Architecture Library's collections support the study of the visual arts and architecture (81,283 vols.; 244,166 slides). Collection strengths include art history, performance and environmental art, photography, painting, sculpture, and architectural design, theory, and history, urban design, landscape architecture, and building technology. The Slide Collection provides visual materials for on-campus instructional purposes.

BIOMEDICAL LIBRARY AND MEDICAL CENTER LIBRARY

Basic Science Building, School of Medicine
Mail code 0699
(858) 534-3253
http://scilib.ucsd.edu/bml

The Biomedical Library contains collections in biology and medicine which are especially rich in the journal literature of the basic sciences and clinical medicine, with emphasis on cellular and molecular biology, neurosciences, and genetics

(209,974 vols.; 14,871 microfiche). A branch library, the Medical Center Library (22,479 vols.), supports the activities of health care providers at the UCSD Medical Center in the Hillcrest area of San Diego. Mail code 8828, (619) 543-6520.

CLICS (Center for Library & Instructional Computing Services)

Galbraith Hall
Mail Code 0318
(858) 822-5427

Opened in fall 2000, CLICS offers more than 200 computer workstations, group study rooms, a popular reading collection, a reference collection, current magazines and a popular computing collection, and a program of library instruction and outreach. CLICS offers research classes and workshops like Contemporary Issues 50, a two-credit course on how to find, evaluate, and use information; writing class workshops; and one-on-one appointments to help you with your research.

CMRR (Center for Magnetic Recording Research Library)

Center for Magnetic Recording Research
Mail code 0401
(858) 534-6199

Formed in October 1984, the Information Center provides a centralized location for information resources on magnetic recording, including books, journals, theses, technical reports, standards and specifications, videotaped seminars, corporate information sources, and databases. The holdings of the CMRR collection are listed in the University of California's catalog MELVYL. Holdings, including items on order, materials in process, and loan information are also available in the UCSD Libraries' catalog ROGER. These catalogs, along with many other resources are available through the UCSD campuswide information system InfoPath.

FILM AND VIDEO LIBRARY

West Wing, Geisel Library
Mail code 0175Q
(858) 534-8074

The Film and Video Library collection includes over 7,703 videos, laser discs, DVDs, and films. Collection strengths include feature films, documentaries, experimental film, and the Factual Film archive. Moving image materials on course reserve are available at the Film and Video Reserves service point.

INTERNATIONAL RELATIONS AND PACIFIC STUDIES LIBRARY

Robinson Complex, Bldg. 3
Mail code 0514
(858) 534-7785

The IR/PS Library features materials on contemporary political, economic, and business affairs in East Asia, Latin America, and the rest of the Pacific Basin region (109,233 vols.; 123,272 microfiche).

THE MANDEVILLE SPECIAL COLLECTIONS LIBRARY

West Wing, Geisel Library
Mail code 0175S
(858) 534-2533

http://orpheus.ucsd.edu/speccoll/

The Mandeville Special Collections Library houses rare books, manuscripts, archives, original art, and other primary materials (250,000 books, 30 million manuscripts) which support specialized UCSD research and instructional programs. Areas of strength include experimental American poetry, the Spanish Civil War, Baja California, early voyages of exploration to the Pacific, twentieth-century science, Melanesian anthropology, California history, Dr. Seuss, and the history of UCSD.

MUSIC LIBRARY

West Wing, Geisel Library
Mail code 0175Q
(858) 534-8074

Located on the first floor of Geisel Library, the Music Library contains a strong collection of books and periodicals emphasizing music of the twentieth century and music theory, as well as music scores centered around twentieth-century and chamber music performance materials (27,974 vols.; 48,975 scores; 79,598 sound recordings). The Listening Room has sixty stations for listening and viewing of course reserve and related materials; it contains a large and diverse collection of music and spoken word Lp recordings, CDs, audio tapes, and CD-ROMs.

SCIENCE AND ENGINEERING LIBRARY

East Wing, Geisel Library
Mail code 0175E
(858) 534-3258

The Science and Engineering Library contains strong collections in the physical sciences and technology (279,268 vols.; 390,914 microfiche). Of particular importance are its research materials in chemistry, computer science, electronics, engineering, mathematics, physics, space sciences, nuclear energy, and materials science. Course reserve materials used by faculty in the physical sciences and engineering are provided at the circulation desk.

SCRIPPS INSTITUTION OF OCEANOGRAPHY LIBRARY

Eckart Bldg.
Mail code 0219
(858) 534-3274

Scripps Institution of Oceanography Library is one of the largest marine science libraries in the world (208,440 vols.; 778,311 maps; 68,614 microfiche). It has outstanding collections in marine biology, oceanography, and marine technology, and also specializes in geology, geophysics, and zoology.

SOCIAL SCIENCES AND HUMANITIES LIBRARY

(located north of the Price Center in Geisel Library)
Mail code 0175R
(858) 534-3336

The SS&H Library houses the research collections in the social sciences and humanities (2,121,259 bound vols.; 142,390 maps; 2,357,376 microfiche). Its reference collection contains an outstanding collection of bibliographies, indexes, encyclopedias, biographical directories, and other information resources in print and electronic form. The Government Information Collection is a depository for the official publications of California and the United States, and also contains a major topographical and political map collection. Course reserve materials used by faculty in their classes are provided electronically and at the circulation desk.

Student Services and Programs

Vice Chancellor, Student Affairs

Building 112 University Center
Mail code 0015
(858) 534-4370
http://vcsa.ucsd.edu

The Office of the Vice Chancellor of Student Affairs is responsible for the overall quality of life at UCSD for undergraduate and graduate students. The office provides coordination and direction to more than two dozen student service departments and works closely with other components of the campus to ensure that programs, services, policies, and procedures foster the development of students and the achievement of their academic and career goals.

Career Services Center

Located on Library Walk
Mail code 0330
(858) 534-3750
http://career.ucsd.edu

The Career Services Center (CSC) helps students and alumni with virtually any career-related concern and offers a wide range of programs and services throughout the year. Online registration at http://career.ucsd.edu is required to use the center.

Exploring Career Options: Career advisers meet one-on-one with students to guide them through the phases of career development. Self-assessment tools, panel presentations, occupational resources, and networking programs are available to help students explore career options and determine career goals. CSC's new Career Information Lab features career books, CDs, and videos, as well as computers for accessing career information on the Internet.

Internship Resources: All students are encouraged to gain practical work experience through internships. CSC is a one-stop shop for internship resources, information, and opportunities. Services include advising, workshops, internship listings, and the Internship SuperSite at http://career.ucsd.edu. The new Internship Resource Room includes internship directories, career-specific internship books, and computer stations to help students find local, regional, and national internships, including the UCDC Program in Washington, D.C.

Graduate and Professional School Preparation and Admission: All students considering an advanced degree in any field after graduation from UCSD should visit CSC for advice and information on schools, admission requirements, applications, reference letters, tests, essays, fellowships, and interviews. Advisers assist students interested in any field of professional and graduate education, including medicine, law, business, teaching, and other health fields. Resources include over 2,000 professional and graduate school catalogs, directories, and brochures. Recruiters from across the country attend CSC's Professional and Graduate School Info Fair and Law School Info Fair each fall.

Job/Internship Listings: CSC lists thousands of internships and part-time and full-time job listings year-round, including on-campus and off-campus work-study and non-work-study jobs. To access the listings, you must: 1) be currently enrolled at UCSD; or newly enrolled and have returned the UCSD Statement of Intent to Register; and 2) complete the online registration at http://career.ucsd.edu. Students are required to update their registration each academic year.

Job Search Preparation and Networking: Services include job search programs, resume and curriculum vitae critiques, and practice interview workshops. Professional association contacts and career consultants are available for job search advice and career information. CSC presents a series of networking events each spring to connect students with professionals.

Job Fairs and On-Campus Interviewing: CSC presents a Science & Technical Job Fair (fall), Winter Job Fair and Spring Job Fair each year featuring recruiters from a variety of employers. Recruiters also conduct interviews on campus at CSC for career positions and internships.

Graduate Student Services: CSC offers special workshops and resources for master's and Ph.D. students seeking academic or nonacademic careers. Resources include job search handbooks and a UCSD alumni contact list of nearly 700 Ph.D. recipients.

Alumni Services: University of California alumni are eligible to use all CSC programs and services. Alumni registration fee required.

Online Resources: The CSC Web site features helpful resources and links, in-depth information, and easy-to-print publications for UCSD students and alumni, faculty and staff, parents, and recruiters.

Calendar of Events: CSC offers a variety of information sessions, group workshops, and special presentations. A quarterly calendar is available online and at CSC.

For more information and building hours, call (858) 534-3750 or go to http://career.ucsd.edu.

College Dean of Student Affairs' Offices

Revelle, Mail code 0321, (858) 534-3492
http://revelle.ucsd.edu

Muir, Mail code 0106, (858) 534-3587
http://muir.ucsd.edu

Marshall, Mail code 0509, (858) 534-4390
http://marshall.ucsd.edu

Warren, Mail code 0422, (858) 534-4731
http://warren.ucsd.edu

Roosevelt, Mail code 0069, (858) 534-2237
http://roosevelt.ucsd.edu

Sixth College, Mail code 0054, (858) 822-5953
http://sixth.ucsd.edu

The offices of the college deans of student affairs perform many functions. They provide help, advice, counseling, and referral for students and parents in many areas including commuter, transfer, and residential matters. The deans' offices develop and coordinate activities such as Orientation, Welcome Week, commencement; leadership and co-curricular learning opportunities; decisions about remaining in or withdrawing from school; college disciplinary matters; involvement in student governments; community service/volunteer opportunities; planning social, educational and cultural activities; assisting students with disabilities; and assisting in hearing procedures regarding grievances.

Contact your college dean of student affairs' office for assistance, particularly if you do not know which university office or resource would best be able to assist you with your problem or concern.

Dining Services

Administration: Muir Commons Annex
Mail code 0122
(858) 534-7587
www.hds.ucsd.edu

Students, faculty, staff, and members of the public are welcome at all UCSD Dining Services restaurants. Eleven locations serve a variety of high-quality and ethnically diverse food. Each offers a comfortable dining atmosphere with unique menus and convenient hours ranging from 7:00 a.m. to 1:00 a.m. Samples menus are online at www.hds.ucsd.edu.

UCSD's college residence program includes housing space and a dining plan of 1,800 Dining

Dollars per year, which can be used at any Dining Services location.

TritonPlus Account, the campus debit account, offers an easy, convenient, and secure way to shop and dine at over forty locations, on and off campus. For more information, go to www.hds.ucsd.edu/tritonplusaccount.

Students use their official UCSD Campus Card to access Dining Dollars and TritonPlus Account.

Additional dining options on campus include six fast-food restaurants and a convenience store located at the Price Center; the Food Co-op and Grove Caffe at the Student Center; and Ché Cafe on Revelle campus. In addition, a limited selection of food may be purchased at portable food carts, convenience stores, and vending machines throughout UCSD.

Disabilities, Office for Students with (OSD)

202 University Center
(858) 534-4382 (Voice/TDD)
(858) 534-4650 (Fax)
http://orpheus-l.ucsd.edu/osd/

The Office for Students with Disabilities (OSD) facilitates student independence, academic/social success, and self-advocacy through access to campus programs, services, and facilities. OSD works directly with students and academic departments on development of effective planning and adaptation. OSD serves as a liaison to UCSD academic departments, the campus community, and off-campus disability-related agencies. Service coordination may include disability management counseling, note takers, sign language interpreters, real-time captionists, readers, typists, library/laboratory assistants, special equipment loans/minor repair, priority registration/enrollment assistance, on-campus housing coordination, exam accommodations, on-campus transportation/parking coordination, and referrals. College learning skills seminars (including memory strategies, note-taking, test taking, time management, and study skills) are offered on an individual and small group basis in collaboration with OASIS. In addition, OSD provides disability awareness through maintenance of a resource library of books, periodicals, articles, films, video formats, and an online quarterly newsletter, *Aware.*

Students who have been diagnosed as having a disability should consult promptly with a qualified specialist at the Office of Students with Disabilities (OSD), as only students registered with OSD are eligible for accommodation in classes. In order to implement an OSD-approved accommodation for examinations or assignments, students must meet with the course instructor within the first two weeks of the quarter and present a certificate from OSD recommending the appropriate accommodations.

If the student's disability has been certified by OSD, the course instructor should accommodate the student's needs. Faculty are not responsible for determining what accommodations are appropriate for a particular student. If an instructor is presented with a claim of a disability by a student who has *not* been certified by OSD, the course instructor should refer the student to OSD and not become personally involved in diagnosing or evaluating the seriousness of the disability. OSD is available to assist instructors in providing accommodation. If for any reason an instructor cannot meet the request, the department chair and OSD should be promptly consulted.

The full text of the Policy on Students with Disabilities and Steps for Academic Accommodation has been posted to the Academic Senate Web site (as an Appendix to the San Diego Division Regulations), at the following address: http://www-senate.ucsd.edu/apxtoc.html.

Financial Aid

All financial assistance for undergraduate and medical students and need-based aid for graduate students is administered by the Financial Aid Office (FAO). Information relating to graduate student support in the form of fellowships and assistantships is presented in the catalog section entitled "Graduate Studies."

The Financial Aid Office, which also includes the Undergraduate Scholarship Office and the Office of Veterans' Affairs, is located in University Center 201 and can be contacted at the phone numbers below.

Financial Aid Office	(858) 534-4480
Scholarship Office	(858) 534-3263
Veterans Affairs	(858) 534-4480
Medical School Financial Aid	(858) 534-4664

Our email addresses are: finaid@ucsd.edu, scholarships@ucsd.edu, vao@ucsd.edu (Veterans Benefits).

Other information about our services and programs is available on our Web site: **http://www.ucsd.edu/finaid**.

Applications and requests for information should be addressed to the Financial Aid Office, 0013, 9500 Gilman Drive, La Jolla, California 92093-0013.

No student should leave the university for financial reasons before exploring all possible avenues of assistance with a Financial Aid Office counselor. *All information contained herein is intended to serve as a general guide and is subject to change due to new and revised federal, state, and University of California regulations and procedures.*

Applying for Financial Aid

A student is eligible for financial aid if she or he:

1. Is a United States citizen or eligible noncitizen.
2. Has a valid social security number.
3. Is not in default on a federal student loan or has made satisfactory arrangements to repay it.
4. Does not owe money back on a federal student grant or has made satisfactory arrangements to repay it.
5. Is registered with Selective Service (males at least eighteen years old, unless not required).
6. Is enrolled at UCSD (minimum of six units per quarter) in a degree or certificate program. Limited status students (non-degree/non-certificate) enrolled in a course of study necessary to be accepted in a degree or certificate program are only eligible for one year of Federal Stafford Loan(s). After one year, these limited status students are not eligible for any financial aid funding.
7. Is making satisfactory academic progress for financial aid recipients.

Students must maintain Satisfactory Academic Progress as a condition for maintaining eligibility for financial aid. For UCSD undergraduate financial aid recipients the standards are thirty-six units (or an average of twelve units per quarter for full-time enrollment) and an overall grade-point average of 2.0 during the current academic year and the following summer (similar unit requirements apply to graduate students who must maintain a 3.0 minimum GPA). Under-graduate students are considered for all financial aid sources up to their fifth year of college attendance (except for Cal Grants) and limited funding up to their sixth year. For

graduate student duration requirements and for more detailed information on UCSD's Satisfactory Academic Progress standards for students enrolled full-time in a degree program, please see our Web site at www.ucsd.edu/finaid. For policy information on *approved* part-time status students, limited status and extension students, please contact the Financial Aid Office.

For evaluation of financial need, all applicants must submit a *Free Application for FederalStudent Aid (FAFSA)* or *renewal FAFSA* and, if requested, copies of the 2003 federal income tax returns, and any other required documents. The *FAFSA* form should be filed by March 3, 2004, the UCSD priority filing date, with the appropriate processing agency and must indicate the University of California, San Diego (list Federal School Code 001317) to receive a processed copy of the *FAFSA*. Late applicants will be considered for limited aid.

Receiving Financial Aid

UC financial aid for students with demonstrated financial need is funded by a combination, or "package", of gift and self-help aid. Grants and scholarships are awards that do not have to be repaid. Self-help aid may consist of a loan, which does have to be repaid, or a work-study award, earned by working a part-time job while attending school, or a combination of both. UCSD ensures that students in similar circumstances receive similar packages. Grant funds are directed to the most needy students. Students who are nonresidents of California should note that need-based financial aid funds are not sufficient to meet the additional cost of nonresident tuition ($13,730 during 2003–2004). The family should be prepared to provide this amount from their own personal resources or educational loan programs. The various types of aid and programs which may be included in need-based packages are listed below:

Federal Pell Grant

The Federal Pell Grant program is designed to provide financial assistance to undergraduates attending postsecondary educational institutions. Amounts range from $400–$4,050 for 2004–2005.

University of California Grant Program

The University of California Grant Program provides grants to undergraduate and graduate students.

Federal Supplemental Educational Opportunity Grant (SEOG)

SEOG awards are federally funded and are available only to undergraduates. Awards may range from $100 to $4,000 per academic year.

Cal Grants (Undergraduate)

Cal Grants are awarded by the California Student Aid Commission to undergraduate California residents. All resident applicants for UCSD aid are required to apply for a Cal Grant. To be considered as a new winner, the *FAFSA* or *renewal FAFSA* and the GPA Verification Form must be postmarked prior to March 3, 2004. Current recipients must file a *FAFSA* or a *renewal FAFSA* each year to have their award renewed.

Repayable Scholarships/Fellowships for Teaching Credential Students

The Cal Grant T is awarded by the California Student Aid Commission to students who have been accepted into the Teaching Credential Program. The Governor's Teaching Fellowship (GTF) Program is administered by the California State University system. Those wishing to apply need to contact the UCSD Teacher Education Program at (858) 534-1680.

Work-Study

Federal and state work-study awards are employment programs that provide funds for student employment by the university or by public and private profit/nonprofit organizations. The work-study program provides experience in many fields, including experimental sciences, library work, recreation, computer sciences, peer counseling, and office work. Pay ranges from minimum wage and above. Job listings and referrals are provided through the Career Services Center.

Federal Perkins Loans

This loan carries a 5 percent interest rate. Students begin paying both the principal and the interest nine months after ceasing to be enrolled at least half-time.

Federal Subsidized Stafford Loans

The annual maximum allowed during the first year of undergraduate study is $2,625. Sophomores can borrow an annual maximum of $3,500, and the yearly limit for juniors and seniors is $5,500, with an undergraduate cumulative maximum of $23,000. Graduate students may borrow up to $8,500 per academic year with an aggregate sum up to $65,000, including the amount borrowed as an undergraduate. The interest rate for new borrowers is variable, not to exceed 8.25 percent. The 2003–2004 rate was 2.82 percent.

The federal government pays (subsidizes) the interest on the student's behalf during in-school (enrolled in six units or more), grace, and authorized deferment periods. Repayment of principal and interest begins six months after the borrower leaves school or ceases to be enrolled as a half-time student.

Federal Unsubsidized Stafford Loans

Students who do not have financial need eligibility for the maximum Federal Stafford Loan may borrow under this program. The annual maximum and interest rate are the same as the Subsidized Stafford Loan. Independent undergraduates may borrow an additional $4,000–$5,000 annually; graduate students may borrow an additional $10,000 annually. The maximums include amounts borrowed under the Federal Stafford Loan program. Aggregate maximums are $23,000 for dependent undergraduates, $46,000 for independent undergraduates, and $138,500 for graduate students. The interest is **not** paid on the student's behalf. Interest begins accruing immediately after disbursement, but payment of principal and interest may be deferred until six months after ceasing to be enrolled for six units or more. The amount borrowed cannot exceed the cost of education minus other financial aid resources (including other need-based loans).

Federal PLUS Loans for Parents

Parents of dependent undergraduate students are eligible to borrow under this program if they have no adverse credit history and meet program eligibility requirements. The interest rate for this loan is variable, but not to exceed 9 percent. In 2003–2004, the interest rate was 4.22 percent. Parents are eligible to borrow up to the cost of education minus other financial aid (including other loans). The first payment is due within sixty days after disbursement by the lender.

Triton Registration Installment Plan (TRIP)

The UCSD Triton Registration Installment Plan (TRIP), administered by the Student Business Services (SBS), is a monthly payment arrangement and is available for students who desire an alternative method of financing their

registration fees on a short-term basis. All students in good financial and academic standing are eligible for the program, except for those students whose financial aid or graduate support will pay their registration fees by the quarterly registration fee due date. A prerequisite to applying for the program is enrollment for the term. The TRIP allows registration fees to be paid in up to three installments each quarter. On a three-month plan, the first payment is required by the quarterly registration due date. The remaining payments are itemized on the student's next two monthly UCSD Billing Statements. There is a $30 nonrefundable quarterly fee that must be submitted with the application to the Billing Services unit of the Student Business Services Office. This fee is strictly used to offset the costs of the program. For further information, please contact the Billing Services Unit at (858) 534-6806, or online at: http://www-bfs.ucsd.edu/bur.

Short-Term Emergency Loans

The limited emergency loan funds, administered by the Financial Aid Office, are loaned in small amounts to help students in critical short-term emergencies, and usually must be repaid within thirty days. There currently is a service charge of $20 per emergency loan, and students must be enrolled in at least six units. Registration fees must be paid prior to applying. Applications and further information are available from the Financial Aid Office.

Federal Tax Credits

Two federal tax credits may benefit you or your parents, if the grants and scholarships you receive do not fully cover your fees. Both tax credits are tied to the tuition and fees paid for college.

The Hope Scholarship Credit (up to $1,500) is available for the first two years of at-least-half-time enrollment in postsecondary education.

The Lifetime Learning Credit (up to $1,000 per tax year) is available for postsecondary enrollment at any level.

To find out more about these tax credits, consult your tax adviser or visit the U.S. Dept. of Education Web site www.ed.gov/inits/hope/ and the "Where Do You Want To Go" section on StudentLink.

Graduate Financial Assistance

See catalog section titled "Graduate Studies" for additional types of financial assistance available to graduate students.

THE UNDERGRADUATE SCHOLARSHIP PROGRAM

The purpose of the Undergraduate Scholarship Program at UCSD is to recognize outstanding achievement, to encourage academic excellence, and to offer support to meritorious students.

Scholarships are awarded on a competitive basis by the UCSD Faculty Committee on Undergraduate Scholarships and Honors. **Merit** scholarships are awarded on the basis of academic excellence. **Restricted** scholarships are awarded based on one or more additional criteria or restrictions such as financial need, study in a particular major, or leadership. Students who are awarded scholarships restricted by financial need must file a Free Application for Federal Student Aid (FAFSA) in order to receive the award. Additionally, undergraduate research scholarships are offered to current students which enable them to pursue special studies and projects under faculty supervision.

UCSD is actively engaged in developing new scholarship opportunities. Many of these awards were established through the generous support of individual sponsors, foundations, businesses, and community organizations. Every gift toward undergraduate scholarships is appreciated and appropriately recognized. Further information about supporting scholarships at UCSD may be obtained from Kim Signoret Paar, director of Student Affairs Development. Ms. Signoret may be reached at (858) 822-1536. Her address is 9500 Gilman Drive, La Jolla CA 92093-0937.

You may view a listing of scholarships, financial aid resources, and information on outside agency scholarship opportunities on the UCSD Financial Aid Office (FAO) Web page at: **http://www.ucsd.edu/finaid**.

The Scholarship Office is part of the UCSD Financial Aid Office and is located in Building 201, University Center, 9500 Gilman Drive, La Jolla, CA 92093-0013. Office hours are from 8:00 a.m. to 4:30 p.m., Monday through Friday. For additional information regarding the scholarship program, contact the Scholarship Office at scholarships@ucsd.edu or (858) 534-3263.

HOW TO APPLY FOR SCHOLARSHIPS

Entering Students

The University of California Application for Undergraduate Admission and Scholarships is also used to apply for the UCSD Regents and other campus scholarships. No other paperwork is required. The application is submitted in November for the following academic year. Because scholarships are awarded to entering students on a very competitive basis, students should carefully comply with instructions on the UC Application for Undergraduate Admission and Scholarships to ensure full consideration for all eligible scholarships. Entering students who receive a scholarship from UCSD will be notified in writing before May 1. We regret that we are unable to mail denial notification letters to other applicants.

Current UCSD Students

Current UCSD students apply for scholarships annually during winter quarter for the following fall quarter by filing the UCSD Continuing Student Scholarship Application. This application is available online via StudentLink in February and is due in April. Current students who receive a scholarship from UCSD will be notified in writing by the end of June. Students who do not receive an award will not be notified due to the large volume of applications.

UCSD Undergraduate Scholarships

The scholarships listed below are generally available at UCSD. Although every effort is made to present the most accurate information, this listing is subject to change due to federal, state, and university funding limitations, and changes in policy or law.

Entering Freshman Awards

Art for Science Scholarship: Awarded to Sixth College entering freshmen that have an interest in science and art and have shown outstanding performance in the visual or performing arts. This is a one-year award up to $2,500.

James Avery Scholarship: Awarded to an African-American student pursuing studies in the performing arts at Thurgood Marshall College. This is a four-year award up to $4,000, paid in the amount of up to $1,000 annually.

Bay Area Alumni Scholarship: Awarded to entering freshmen, from the Greater Bay Area, based on demonstrated financial need and academic merit. This is a four-year award of up to $10,000, paid in the amount of up to $2,500 annually.

Black Alumni Scholarship: Awarded to entering African-American students based on academic merit. This is a four-year award up to $4,000, paid in the amount of up to $1,000 annually.

Chancellor's Scholarship: Awarded to outstanding entering freshmen on the basis of academic achievement, and other factors, which may include the personal essay, financial need, extracurricular and community activities, educational environment, and first-generation college attendance. As a Chancellor's Scholar, students will receive the following benefits: extended housing benefits (provided housing deadlines are met) and priority registration for four years as a UCSD scholar; and participation in the Study Abroad and Faculty Mentor programs. This is a four-year award, up to $20,000, paid in the amount of up to $5,000 annually.

Clayton H. Brace Scholarship: Awarded to an entering student with an interest in communications. This is a one-year award. The award amount varies.

CREATE Undergraduate Scholarship: Awarded to entering freshmen that have graduated from a San Diego high school participating in the UCSD CREATE program. The amount and term of the award varies.

Del Mar Thoroughbred Club Scholarships: Awarded to entering freshmen from San Diego and Imperial County high schools, based on academic achievement, financial need, and community involvement and/or participation in school extracurricular activities while in high school. This is a four-year award up to $10,000, paid in the amount of up to $2,500 annually.

Herbert Greenberg Memorial Scholarship: Awarded to entering freshmen based on academic merit and demonstrated financial need. The award amount and term varies.

Hispanic Scholarship Council Scholarship for Community Service: Awarded to entering freshmen based on community service, demonstrated academic merit and financial need, with a preference for first-generation college students, open to all students regardless of ethnicity. This is a four-year award up to $10,000, paid in the amount of up to $2,500 annually.

Charmaine and Maurice Kaplan Scholarship: Awarded to entering students on the basis of academic merit, demonstrated financial need, and involvement in extracurricular activities. The award amount and term varies up to $2,000 per year.

Kelly J. Kolozsi Scholarship: This outside agency scholarship is awarded to students in the following priority: (1) Graduates of Menlo Atherton High School; (2) graduates of a high school in the Sequoia Union High School District. Preference is given to students diagnosed with a learning disability. This is a one-year award. The award amount varies. The recipients are chosen by the Kolozsi Scholarship Selection Committee.

Madge E. Lawhead Scholarship: Awarded to outstanding entering freshmen on the basis of academic achievement, and other factors, which may include the personal essay, financial need, extra-curricular and community activities, educational environment, and first-generation college attendance. As a Lawhead Scholar, students will receive the following benefits; extended housing benefits (provided housing deadlines are met) and priority registration for four years as a UCSD scholar; and participation in the Study Abroad and Faculty Mentor programs. This is a four-year award up to $20,000, paid in the amount of up to $5,000 annually.

McFarland Scholarship: Awarded to Native-American entering freshmen based on academic merit and financial need. This is a four-year award up to $10,000, paid in the amount of up to $2,500 annually.

Dr. A.R. Moossa Scholarship: Awarded to a premedical student who plans a career as a physician, who has financial need, is a full-time student with at least a 3.0 GPA. This is a four-year award up to $7,680, paid in the amount of up to $1,920 annually.

National Merit University-Sponsored Scholarship: Awarded to entering freshmen who are National Merit finalists and who are sponsored by UCSD. Finalists are nominated by the National Merit Scholarship Corporation for their exceptional academic performance in high school. This is a four-year award. Students with demonstrated financial need may receive up to $2,000 per year. Students without demonstrated financial need receive $500 per year. Four-year UCSD-sponsored and corporate-sponsored National Merit Scholars are also eligible for certain privileges such as preferred class enrollment, extended housing benefits for four years (providing housing deadlines are met), extended student library privileges, and expanded computer accounts. One-year National Merit Office sponsored and one-year corporate-sponsored National Merit Scholars, are eligible for housing for freshman and sophomore years (providing housing deadlines are met). One-year scholars will also receive priority registration, extended library privileges, and expanded computer accounts for their freshman year only.

Sheila Owens-Collins Scholarship: Awarded to an African-American student pursuing studies in the life sciences. This is a four-year award up to $4,000, paid in the amount of up to $1,000 annually.

Parker Foundation Scholarship: Awarded to an outstanding entering freshman from a San Diego or Imperial County high school that has made valuable contributions through community service. This is a one-year award and the amount varies up to $3,000.

George Parker Memorial Scholarship: Awarded based on financial need to students who were orphaned for at least three years prior to the age of 18, and/or who were raised in foster care for at least three years immediately prior to the age of 18. Students must show evidence of orphan or foster care status. This is a renewable award, paid in the amount of up to $2,000 annually.

Mary Pillot Scholarship: Awarded to meritorious graduates of San Jose High School Academy, as nominated by the high school principal. This is a one-year award up to $500.

Ray and Betty Ramseyer Scholarship: Awarded to an entering student with an interest in the social sciences. This is a four-year award up to $4,000, paid in the amount of up to $1,000 annually.

Regents Scholarship: The Regents Scholarship is the most prestigious scholarship awarded to outstanding entering freshmen on the basis of academic achievement, and other factors which may include the personal essay, financial need, extracurricular and community activities, educational environment, and first-generation college attendance. This scholarship is offered to entering freshmen for four years. If a student is offered the Regents Scholarship and has financial need, the student will receive additional scholarship and/or grant funds up to the amount of demonstrated need for four academic years, excluding non-resident tuition costs. Entering freshmen applying in the 2004–2005 academic year without documented financial need will receive a four-year honorarium of $20,000, paid at $5,000 per year for the four years of their appointment at UCSD. Entering freshmen apply for the Regents Scholarship through the admissions application. UCSD Regents Scholars are also eligible for certain privileges and recognitions such as preferred class enrollment, extended housing benefits for four years (providing housing deadlines are met),

UCSD college of choice at time of admission, extended student library privileges, honors program, and expanded computer accounts.

Roger and Ellen Revelle Scholarship: Awarded to entering freshmen based on academic merit. This is a four-year award up to $10,000, paid at up to $2,500 annually.

Rose Foundation Scholarship: Awarded to students who graduated from San Diego or Imperial County high schools that historically are underrepresented at UC campuses. Students must have financial need, be full-time students, and they must be in fair academic standing (at least a 2.5 GPA). This is a four-year award up to $7,680, paid in the amount of up to $1,920 annually.

Senior Gift Scholarship: This scholarship was established by UCSD graduating seniors and seeks to recognize outstanding freshmen and transfer students who have proven community service and philanthropic spirit, and who have financial need. This is a one-year award and the amount varies up to $1,000.

Shimotori Memorial Scholarship: Awarded to a student with demonstrated academic merit and financial need. This is a one-year award up to $4,000.

Ludwig & Ada Strauss Scholarship: Awarded to an academically outstanding entering freshman with demonstrated financial need. This a one-year award and the amount varies.

UCSD Student Foundation Scholarships: Awarded to entering freshmen based on demonstrated community service, financial need, and academic excellence. This is a one-year award with a maximum of $5,000.

Awarded to Students Transferring from Community Colleges

Engelhorn Family Scholarship: The Engelhorn Family Scholarships are awarded to transfer students who are participants in the UniversityLink or TAG program, have high financial need, with a preference for students who are first-generation college students. This is a two-year award, paid in the amount of up to $2,000 annually.

High Tech Marketing Alliance Scholarship: Awarded to a transfer student from a community college, majoring in communications, with a 3.0+ GPA, enrolled full time, and who plans on a career in communications or journalism. This is a one-year award and the amount varies.

Current Student Awards

Christopher B. Arrott—Gay, Lesbian & Bisexual Scholarship: Awarded to gay, lesbian or bisexual undergraduate students with a record of active service and involvement in the gay, lesbian, and bisexual community. This is a one-year award up to $1,000.

Charles and Clara Ash Scholarship: Awarded to students with demonstrated financial need. This is a one-year award. The award amount varies.

BAE SYSTEMS Scholarship: Awarded to full-time students who are seniors in the 2004–2005 academic year, with a 3.2+ GPA, majoring in computer science, applied mathematics, computer or electrical engineering with a computer sciences emphasis, are U.S. citizens and plan to pursue a career in computer science in San Diego. This is a one-year award up to $5,000.

Errett Bishop Scholarship: Awarded to upper division mathematics majors with financial need. Preference given to graduating seniors. The award amount varies up to $3,000.

The Darcy C. and Robert Bingham Scholarship: Awarded to full-time students who are in good academic standing and are employed with UCSD Recreation, UCSD Student Affairs, or UCSD. Students must work for an average of ten hours per week during the three-quarter academic year at UCSD, and must have worked at least one quarter prior to the submission of their application. This is a one-year award up to $1,500.

Boeing Engineering Scholarship: Awarded to full-time students majoring in electrical engineering, mechanical engineering, aerospace engineering, computer science, or computer engineering, who have demonstrated high financial need. This is a one-year award up to $1,900.

Braille Transcribers Guild: Awarded to students who are legally blind, or have substantial, uncorrectable vision loss, registered with the UCSD Office for Students with Disabilities. This award amount and term varies.

Julia Brown Undergraduate Scholarship: Awarded to a full-time junior or senior in the 2004–2005 academic year, who intends to pursue a career in the health sciences (including medicine, research, and public health). The award is based on academic merit and financial need. This is a one-year award up to $5,000.

California Retired Teachers Association—Laura E. Settle Scholarship: This outside agency scholarship is awarded to current sophomores or juniors with demonstrated financial need who are planning a career in teaching. Students must be U.S. citizens and residents of California. This is a one-year award and the amount varies up to $2,000.

CK and Jenny Cheng CSE/ECE Scholarship: Awarded to undergraduate students majoring in Computer Science and Engineering or Electrical and Computer Engineering at the UCSD Jacobs School of Engineering, based on academic merit. The scholarship is a one-year award of approximately $400.

Cohu, Inc.—William S. Ivans and Frank W. Davis Scholarships: Awarded to undergraduate students who are enrolled full-time, majoring in mechanical or electrical engineering with at least a 3.0 GPA. This is a one-year $2,500 award.

Conexant Systems Scholarship: Awarded to full-time students majoring in electrical engineering, computer engineering, or computer science, with junior or senior standing in 2004–2005, who will graduate no earlier than December 2005. Potential candidates have an interest related to the semiconductor industry, possess a minimum 3.3 GPA, and are able to work in the United States. This is a one-year award up to $2,800.

Thomas E. Curtis Scholarship: Awarded to juniors or seniors in the 2004–2005 academic year, majoring in the fields of biology, chemistry, or physics, who also demonstrate interest in the larger world around them, with leadership-level involvement outside the classroom, and have a minimum 2.75 GPA. This is a one-year award. The award amount varies.

Richard L. and Fern W. Erion and Laidlaw-Erion Scholarships: Awarded to full-time UCSD students who will be seniors in 2004–2005, with demonstrated financial need, as determined by information submitted on their 2004–2005 FAFSA or renewal FAFSA. The award amount varies.

Brython P. Davis Scholarship: Awarded to current students whose parent is or was a regular member of the U.S. Navy or Marine Corps. This is a one-year award. The award amount varies.

Klara D. Eckart Scholarship: Awarded to current students in the fields of computation, mathematics, or physics. This is a one-year award. The award amount varies.

The Willis and Jane Fletcher Foundation and P and G Company Scholarship: This outside agency scholarship is awarded to a graduate of a San Diego County high school with demonstrated financial need. This is a one-year award up to $2,500.

Jaye Haddad Memorial Scholarship: Awarded to students who have been diagnosed with cancer, with Acquired Immune Deficiency Syndrome, with AIDS-related conditions, or to students with physical disabilities. This is a one-year award. The award amount varies.

E. Coke Hill Scholarship: Awarded to students with demonstrated financial need. This is a one-year award. The award amount varies.

Irvine Memorial Scholarship: Awarded to students based on academic merit. This is generally a one-year award. The award amount varies.

Jeffrey R. Leifer Scholarship: Awarded to current students who have demonstrated financial need and academic merit, are the first generation in their family to attend college, and graduated from California high schools that historically are underrepresented at UC campuses. This scholarship has been established through the generous contributions of Jeffrey R. Leifer. As a student at UCSD, he served as associated student body president and founded International Student Pugwash, a worldwide organization dedicated to issues surrounding ethics, technology, and society. This is a one-year award and the amount varies.

Alice Marriott Scholarship: Awarded to students with demonstrated financial need. This is a one-year award. The award amount varies.

Thurgood Marshall College Scholarship: Awarded to students enrolled in Marshall College who have a 3.2 GPA by the end of spring quarter, and have completed a minimum of seventy-two graded quarter units. Transfer students need thirty-six graded UCSD units with a 3.2 GPA and 3.5 cumulative GPA in advanced standing work. Seniors who apply should have a minimum of thirty-six units remaining to be completed in the academic year the scholarship is awarded with a minimum 3.2 cumulative GPA. This is a one-year award up to $1,500.

Marx and Marshall—Gay and Lesbian Scholarship: Awarded to gay and lesbian students with a record of active service and involvement in the gay, lesbian and bisexual community. This is a one-year award. Preference will be given to students with financial need. The award amount is up to $1,000. Recipients may reapply.

S. Falck Nielsen Scholarship: Awarded to current freshmen. The amount and term varies.

LaVerne Noyes Scholarship: Awarded to current students who are descendants of U.S. World War I Veterans (defined as four months of service in the U.S. military prior to November 11, 1918). This is a one-year award. The award amount varies.

Sven Peterson Memorial Scholarship: Awarded to a current freshman or sophomore, UCSD Warren College student, enrolled full-time, majoring in an area other than engineering or life sciences. The recipient must have been placed on the college provost's honors list at least one quarter during his or her academic career in advance of applying for the award and must maintain a 3.0 cumulative GPA. This award is up to $3,000 per year and may be renewable.

QUALCOMM Scholarship: Awarded to students who are juniors in the 2004–2005 academic year, majoring in electrical engineering, computer engineering, or computer science with at least a 3.15 GPA. Special consideration is given to students who have been a San Diego resident for three or more years, who are willing to consider an internship at QUALCOMM, or who have volunteered a minimum of four hours per month at a K–12 educational institution. This is a one-year award up to $5,000.

Tenie Remmel Memorial Scholarship: Awarded based on academic merit and demonstrated financial need to a full-time student in the Division of Physical Sciences. This is a one-year award of up to $1,000.

Gary C. Reynolds Scholarship: Awarded to students who will be juniors or seniors in 2004–2005, who are mathematics-computer science majors, who show exceptional promise for making future contributions in their field of study. The amount of this award varies up to $2,000.

Mabel Wilson Richards Scholarship: This outside agency scholarship is awarded to women who were residents of the Greater Los Angeles area for two years prior to attending UCSD, with a B average and demonstrated financial need. Must be a U.S. citizen or, if under 21, one parent should possess a permanent resident visa. This is a one-year award. The award amount varies up to $2,000.

Elizabeth W. Russell Scholarship: Awarded to students who will be juniors or seniors in 2004–2005, who are pursuing studies in studio art, art history, or art criticism/theory. The award amount varies.

Bevan Schroeder Memorial Scholarship: Awarded to students majoring in computer science engineering. Selection is based on academic merit, financial need, and involvement in campus activities. This is a one-year award up to $1,000.

Sempra Scholarship: Awarded to juniors or seniors in the 2004–2005 academic year, with majors that lead to careers in technology/information systems (computer science, computer engineering) or careers in electrical or material engineering, including chemical engineering. This is a one-year award up to $4,000.

Malcolm R. Stacey Memorial Scholarship: Awarded to Jewish students in the following priority: 1) undergraduate who is an orphan and preparing for graduate study in aeronautical engineering, 2) undergraduate in the field of aeronautical engineering, 3) a student in the division of engineering, and 4) a student in any field of study. This is a one-year award. The award amount varies.

William H. Stout Scholarship: Awarded to students based on academic merit. This is a one-year award. The award amount varies.

Russ Ty—Gay and Lesbian Scholarship: Awarded to gay and lesbian students based on academic merit and financial need. This is a one-year award. The award amount is a maximum of $1,000.

Visual Arts Endowment Scholarship: Awarded to full-time current students, with the intent to support talented undergraduates majoring in visual arts. This is a one-year award up to $4,000.

If you have any questions regarding graduate scholarships, they should be directed to the Office of Graduate Studies at (858) 534-3555.

UNDERGRADUATE RESEARCH SCHOLARSHIPS

These special awards are for current undergraduate students who wish to engage in special studies or research projects under faculty supervision. The work must be above and beyond the normal course of study. The subject matter does not have to be related to the student's major, minor, or other course work. These are one-year awards; however, a student may submit a new application each year for consideration. Awards are up to $3,000.

Applications are available from the UCSD Financial Aid Office in March and are due in May. Winners are notified by the middle of June. All recipients are required to submit a brief final summary report, including details of how the funds were used. Also, the sponsoring faculty member must submit a review and appraisal of the results of the project.

David Marc Belkin Memorial Research Scholarship will give preference to those proposals designed to pursue special studies and projects in the general areas of environmental and ecological issues. The maximum award amount is $1,500.

Julia Brown Research Scholarships will give consideration to juniors or seniors in the 2004–2005 academic year, whose career objectives include medical school and/or medical research. Preference given to students with extenuating circumstances or financial need. The maximum award amount is $2,500.

Chancellor's Research Scholarship will give consideration to proposals regardless of project topic. The maximum award amount is $3,000.

David Jay Gambee Memorial Research Fellowship will give preference to proposals which involve the student as an active citizen in university governance, the local community, or national and international affairs. Also receiving preference are proposals which lead to a heightened awareness of the relationship between environment and society. Service in the community through volunteer activities or participation in programs related to the Institute on Global Conflict and Cooperation is encouraged. The maximum award amount is $1,500.

Doris A. Howell Foundation Research Scholarship will give consideration to juniors or seniors in the 2004–2005 academic year whose proposals are designed to improve the physical, mental, spiritual and behavioral health, and/or well-being of women. Proposals may encompass all areas related to women's health including biological, medical, cultural, economic, behavioral, psycho-social, or cross-cultural influences. The essay must describe how the project specifically addresses women's health or well-being. The Howell Foundation for Research in Women's Health is a not-for-profit spin-off of Soroptimist International of La Jolla. The maximum award is $2,500.

SCHOLARSHIPS FOR STUDY ABROAD

UCSD students study abroad through the UC Education Abroad Program (EAP) and the UCSD Opportunities Abroad Program (OAP). In addition to the UCSD scholarships listed above, study abroad students may also qualify for special awards restricted to EAP and OAP participants. All of the scholarships listed below require a separate application through the International Center, unless otherwise indicated.

For more information about these scholarships and other outside opportunities for study abroad, contact the Programs Abroad Office at the International Center at (858) 534-1123 or via email to: **abroad@ucsd.edu**.

Betty Tate International Scholarships: Awarded based on financial need and students must have a minimum 2.8 GPA.

Chris Borton Memorial Study Abroad Scholarships: Awarded on the basis of academic merit and without consideration of financial need.

EAP Scholarships: Awarded primarily on the basis of financial need.

Eleanor Roosevelt College (ERC) Scholarships: Awarded to ERC students with financial need. Applicants should apply through ERC.

Friends of the International Center: Awarded predominantly on academic merit, with some consideration of financial need.

Judaic Studies Scholarship: Awarded to students bound for Israel, with preference given to students with a major or minor in Judaic studies. Applicant should apply through the Department of Judaic Studies.

INTERNSHIP PROGRAMS

University of California President's Washington D.C. Scholarship: Awarded to students on internship in Washington D.C. with financial need and a 3.0 GPA. Applicants should apply through the Academic Internship Program Office. Telephone (858) 534-4355 or the UC/DC Program Office, telephone (858) 534-2705.

International Center

(Located at the corner of Gilman Drive and Library Walk)
Mail code 0018
(858) 534-3730
Facility reservation: (858) 534-6442
http://www.ucsd.edu/icenter

The International Center assists U.S. students going abroad as well as international students, scholars and families, and facilitates interaction among all internationally minded UCSD students, faculty, and staff.

Services to students going abroad include advising on a wide range of study, work, and travel opportunities through the UCSD Programs Abroad Office, and administration of the system-wide UC Education Abroad Program.

The International Student/Scholar Office serves as the liaison with government agencies for all nonimmigrants, and advises international students, researchers, faculty, and campus departments about immigration and visa matters. The office also provides pre-arrival information, orientation, and check-in for new students and scholars. The Friends of the International Center provide additional services and programs to international visitors and their family members.

The staff and Friends of the International Center as well as the International Club sponsor a variety of international/intercultural programs and services for all members of the UCSD community. These include lectures, language exchanges, a tutoring program, linkages with international faculty specialists, and weekly international cafes.

The International Center facility also includes a resale shop, a reservable conference room, and a meeting/office facility for Oceanids, the volunteer support organization for the university.

Housing

OFF-CAMPUS HOUSING

Off-Campus Housing is a rental listing referral and housing information resource center. This office receives and maintains up-to-date available rentals from people in the community within the various areas near campus. The rental listings include individual houses, apartments, and condos, as well as roommates, rooms in private homes, and work-exchange situations.

The most popular housing situation involves sharing a house, condo, or apartment with other UCSD students.

The university is located in the midst of a resort area that results in relatively high rent in the coastal towns of San Diego: Del Mar and Solana Beach to the north of campus, La Jolla, and Pacific Beach to the south. A general rule of thumb: the closer to the beach, the higher the rent.

Available through this office are helpful landlord/tenant materials such as: leases, room rental agreements, bus schedules, wall maps, a courtesy phone for local calling, and a variety of house-hunting aids.

Our Web site is useful for students and others unable to come into the office. Search through up-to-date rental listings and available roommates on our online database. Downloadable rental agreement forms are available. Links to

local papers allow access to the classifieds. In addition, answers to frequently asked questions ease anxiety regarding a housing search.

Services are available to registered students, staff, faculty, and alumni of the University of California only. You must show a current UC ID card or official Letter of Acceptance to receive rental contacts. Rental referrals are not mailed, faxed, or given out over the telephone. The office staff will be happy to assist you with any housing questions or concerns. Our office is located in the Student Center, Building A, Suite 200–202 on the second floor.

For further information contact:

Off-Campus Housing
9500 Gilman Drive, Dept. 0309
La Jolla, CA 92093-0309
Phone: (858) 534-3670
Fax: (858) 822-1440
email: offcampushousing@popmail.ucsd.edu
Web site: http://offcampushousing.ucsd.edu

ON-CAMPUS HOUSING

Housing and Dining Administrative Services
Building 310 University Center
Mail code 0055
(858) 534-4010
Web site: http://housing.ucsd.edu
email: housinginfo@ucsd.edu

UNDERGRADUATE RESIDENTIAL HOUSING

Each college houses students in residence halls and/or apartments that are part of a single housing system on campus. While facilities at each college are occupied primarily by students registered at that college, students from other colleges may also be residents.

Residence Halls and Apartments

Residence halls are arranged in suites of eight to ten students who share a study/living room and restroom facilities. Apartments are self-contained units with kitchens, bathrooms, living areas, and combinations of two, three, or four bedrooms. Typically four to five students share an apartment. While incoming freshmen are generally assigned space in residence halls, high demand for on-campus housing has resulted in the assignment of apartment spaces for many incoming freshmen. Rooms are furnished and provide ample space for effective studying, sleeping, and storing of personal belongings, books, and clothes.

Each college's resident dean makes specific room assignments in early September when the majority of spaces are filled. Housing and Dining Administrative Services Office administers all other details related to housing contracts.

General Information

The *Living On Campus Housing Application Instructions Information Brochure* was mailed in mid-March to all who were admitted to UCSD. Only online applications were accepted and students were given instructions on how to apply for on-campus housing via Student Link. To be eligible for on-campus housing, the Housing Application and the Statement of Intent to Register form must have been received by the specified deadline dates. On-campus housing spaces will be filled on a first-come, first-served basis according to the date the housing application was received in the Housing and Dining Administrative Services Office. The priority system is explained in detail in the *Living On Campus Housing Brochure.*

Housing application deadline for fall 2004-05 was May 3, 2004 for incoming freshmen. Due to high demand, transfer students will not receive on-campus housing. For the best selection of housing closest to campus, contact the UCSD Off-Campus Housing Office. Web site address: http://offcampushousing.ucsd.edu
email: offcampushousing@ucsd.edu

The Housing and Dining Administrative Services Office recommends that freshmen, not offered housing by the first of June, call (858) 534-4010 for further information.

AFFILIATED HOUSING (OFF-CAMPUS)

The University of California, San Diego Affiliated Housing Team operates several housing complexes in an effort to provide the highest level of flexibility when selecting your residence.

Mesa Residential Apartments (located minutes off campus) are designed to house single graduate or medical students, couples with or without children, and single parents. Residents must be enrolled full-time in a degree-granting program or Teacher Education Program. The Mesa Residential Apartments offer unfurnished one-, two-, and three-bedroom units. Each unit features carpeting, blinds/drapes, range/oven, and refrigerator. In addition, apartments are prewired for cable television and feature private patios or balconies.

Some units include utilities and some require electricity to be paid by the residents. The community is a parklike setting, and amenities include community rooms, coin-operated laundry rooms, co-op garden plots, storage space for each apartment, ample parking, playgrounds for children, and an outdoor sports area, providing courts for tennis, basketball, and volleyball.

La Jolla Del Sol, a condominium-style community owned by UCSD in San Diego's Golden Triangle, just minutes from campus, is designed to housing UCSD faculty, staff and graduate/medical students.

Each one- and two-bedroom apartment has a full-size washer and dryer, refrigerator, dishwasher, range/oven, ceiling fan, and private patio or balcony. Second- and third-floor apartments have wood burning fireplaces and assigned covered parking. Unassigned parking is also available for all residents. All apartments are prewired for cable.

Residents can enjoy the use of two heated pools with adjoining spas, two lighted tennis courts, and a fitness center and community room. Doyle Community Park is across the street, and local malls and grocery stores are within walking distance. Apartments are assigned on an individual basis. To apply for housing and to be added to the wait list at La Jolla Del Sol, please call (858) 587-1221 or email ljds@ucsd.edu.

SINGLE GRADUATE HOUSING (ON CAMPUS)

Single Graduate apartments (located on the Warren Campus) are designed to house unmarried graduate and medical students without children. Residents must be enrolled full-time in a degree-granting graduate or medical course of study, or participating in the Teach Education Program. Single Graduate Apartments all have four single bedrooms and a shared living room, dining room, kitchen, and bath area. Units are fully furnished with the exception of personal linen and cooking utensils. All utilities are included in the rental rate. All units have cable TV included at no extra charge and optional connections to the campus computer system for a fee. All spaces are available on a twelve-month lease. This is a nonsmoking facility.

NOTE: All policies and procedures concerning the operation of Affiliated Housing, the eligibility for housing, and the application process are subject to change without notice.

For more detailed information on any of the above housing facilities and/or to apply, please visit our Web site: www.hds.ucsd.edu/hsgaffil.

Affiliated Housing Operations
9500 Gilman Drive, MC 0907
La Jolla, CA 92093-0907
(858) 822-3291
email: ahoinfo@ucsd.edu

Psychological and Counseling Services

Central Location:
190 Galbraith
Mail Code 0304
(858) 534-3755
http://www.ucsd.edu/psychserv

Psychological and Counseling Services provide professional assistance with a wide array of personal difficulties that may interfere with academic success. Specific concerns for which students often seek assistance include loneliness and isolation, homesickness, parent/family/partner conflict, difficulty studying, concentrating or test-taking, challenges in interpersonal relations and communication, educational/career concerns, identity issues, sexuality, depression, and anxiety. Students often consult with counselors when experiencing a variety of life issues, transitions, or emotional situations. In order to enhance the UCSD student experience, Psychological and Counseling Services professionals also offer consultation to the university at large regarding a wide range of student issues.

Individual counseling, psychotherapy, marriage or relationship counseling, family sessions, and many issue-focused groups are provided to support the emotional and social growth of students. During the course of a year, special forums, psychotherapy groups, support groups, and psycho-educational groups are offered to students according to their needs and the demand for services. Listings are posted quarterly on the Web site.

Psychological and Counseling Services are geared toward developing a positive and robust mental health climate in the university community. The emphasis is on helping students maintain healthy lifestyles so that they may enjoy a sense of wellness, express themselves with confidence, manifest their creativity and productivity, manage stress successfully, and engage in interpersonal relations as they achieve their career goals.

Psychological and Counseling Services staff are clinical and counseling psychologists and psychologists-in-training. Student peer counselors present programs concerning a variety of topics to student groups throughout the year. In order to provide greater accessibility, the service has offices in all colleges in addition to the central location. Services are available to any currently enrolled undergraduate or graduate student, and appointments can be arranged by contacting the central office. The counseling relationship is private and confidential.

Recreation

RIMAC
Mail code 0529
(858) 534-4037
http://recreation.ucsd.edu

Campus Recreation provides UCSD students with quality recreation programs. They are designed to meet leisure-time needs and interests through on-campus programs offering clubs, intramural sports, recreation classes, outings, and a myriad of activities and special event programming. Our goal is to provide opportunities promoting a lifetime of health-conscious options.

FACILITIES

RIMAC with arena, gymnasium, weight room, racquetball and squash courts, and equipment room.
Main and Recreation Gymnasia
Main Gym Weight Room
Indoor 25-Yard Natatorium Pool and Spa
Outdoor 50-Meter Canyonview Pool and Spa
Outback Indoor Climbing Center
Outback Team Challenge Course
Tennis Courts
Playing Fields
Canyonview Weight Room
Golf Driving Range
Mission Bay Aquatics Center
Spanos Training Facility with weight training equipment, martial arts studio, and trainers' facility
Running and Jogging Track
Par Courses
Sand Volleyball Courts
Outback Adventures equipment rentals

INTRAMURAL SPORTS

The Intramural Sports Program at UCSD is a balanced blend of team and individual sports activities that are designed to meet the diverse needs of the campus community. Sports offered include flag football, floor hockey, tennis, basketball, softball, soccer, bowling, volleyball, tube waterpolo, and badminton.

RECREATION CLUBS

Recreation Clubs are special-interest activity clubs open to the entire campus community. The clubs are designed to bring together people with common interests. Students may join or begin new recreation clubs and participate in the workouts, meetings, social gatherings, and special events that are part of the RecClub structure.

SPORT CLUBS

Sport Clubs are those teams that compete on an intercollegiate basis but without many of the restrictions of the formal Intercollegiate Athletic Teams. The clubs offer students the opportunity to become involved in somewhat less traditional competitive sports, while still enjoying the travel to and competition against other institutions. Teams include ballroom dance, badminton, dance sport, dance team, triathlon, equestrian, water ski, cycling, lacrosse, sailing, surfing, rugby, alpine ski/snowboard racing, ice hockey, ultimate disc, and wrestling.

RECREATION CLASSES

Recreation classes provide students and the university community an opportunity for non-credit, nongraded instruction in a range of physical and leisure activities. The program includes professional instruction in everything from cardio and conditioning, tennis, weight training and swimming to karate, gymnastics, dance, and yoga.

OUTBACK ADVENTURES

Outback Adventures (outdoor recreation program) is a passport to adventure and the great outdoors. The program offers fun, full-service trips (transportation, meals, instruction, equipment) in backpacking, rock-climbing, cross-country skiing, canoeing, kayaking, mountain-biking, and other outdoor pursuits. The Outback Adventures director will also arrange customized trips. In addition, the program offers instructional workshops, a resource library of maps and park information, and a camping and outdoor equipment rental service which includes downhill and cross-country skiing equipment, camping equipment, and game equipment. Outback also runs the indoor climbing center, with facilities for beginning to advanced climbers, rentals, and instruction.

AQUATICS

UCSD Campus Recreation Aquatics encompasses a wide range of aquatic activities. Student users can participate in competitive and training programs in swimming and water polo. Masters Programs in swimming, running, and triathlon provide an intensive competitive and training experience. Special events scheduled throughout the year range from student social activities to international team competitions. Additionally, an extensive recreational lap swim program is maintained to accommodate daily users from the campus and community.

INFORMAL RECREATION

Informal recreation provides individuals and groups of students the opportunity to make use of any and all of the physical activity facilities at UCSD. From jogging on the par course to shooting hoops in the gym, or playing racquetball in RIMAC, "open rec" time allows students to develop their own leisure activities.

MISSION BAY AQUATIC CENTER

Located on Santa Clara Point in Mission Bay, this facility and its programs provide students with an exclusive opportunity to participate in all aspects of aquatic recreation. From highly structured classes to equipment rentals, MBAC is a "first class" operation. (488-1036)

PERSONAL WELLNESS

Our weightroom and Personal Wellness programs offer a free student personal wellness program with small groups and personalized comprehensive fitness program for sixty students each quarter. Nutrition counseling, personal fitness assessments, and massage therapy are also offered.

INTERCOLLEGIATE ATHLETICS AT UCSD

http://athletics.ucsd.edu

With 23 intercollegiate teams to choose from the UC San Diego Athletics program provides students with varying interests the opportunity to participate in a highly-competitive program. As a non-scholarship institution, UCSD's Tritons have competed in the NCAA Division III, achieving national prominence in nearly every sport. In 1998, UCSD won the Sears Directors' Cup, which is awarded to the nation's top overall athletics program in the NCAA Division III. In the fall of 2000, UCSD moved to Division II and immediately captured an NCAA Championship in Women's Soccer while finishing runner-up in the NCAA Water Polo Championship.

Triton teams have captured 94 first-, second-, and third-place national finishes, led by Women's Volleyball's seven titles. Women's Soccer has won six championships, followed by Women's Water Polo with five, Women's Tennis with four, Men's Soccer with three and Men's Golf with one national championship. Individually, 90 Tritons have won national championships while a remarkable 721 have earned All-American Recognition. Tritons have been named Academic All-Americans on 122 occasions and 10 student/athletes have been awarded the prestigious NCAA Postgraduate Scholarship.

Sports offered for men and women include basketball, crew, cross country, fencing, soccer, swimming and diving, tennis, track and field, volleyball, and water polo. Men's baseball, men's golf, and women's softball are also offered.

With the move to Division II, most teams now compete in the California Collegiate Athletic Association, widely considered to be the top Division II athletic conference in the country.

In addition to athletic competition, UCSD students may get involved through support groups, game management, and internships. The UCSD Pep Band has grown steadily in recent years and is a fixture of spirit at all basketball and volleyball events. In 1999, the Triton Tide made its debut as a student booster club, and students may also join the UCSD Cheerleaders, the UCSD Twirl Flag Team, or the UCSD Dance Team. In addition to the student groups, Triton Athletic Associates, a booster group of parents, alumni, and friends assists UCSD Athletics with much-needed financial support. Students interested in a firsthand experience in the operations of an athletics program should check into opportunities to work in game management, which provides the staff for all home athletic events, or inquire about internships within the Athletics Department.

Religious Affairs

Building 201 University Center
Mail code 0081
(858) 534-2521

The Office of Religious Affairs (ORA) is a privately funded program that promotes dialogue on moral, ethical, spiritual and religious issues, questions, and concerns. Professional staff provides non-sectarian consultation, counseling, and education for the campus community.

Student Office for Human Relations (SOHR)

Main Gym, Floor 2
Mail Code 0362
(858) 534-6708, sohr@ucsd.edu
http://ugr8.ucsd.edu/sohr

The Student Office of Human Relations, (SOHR), monitors and assesses campus programs, practices, and procedures to maximize achievement by UC/UCSD of a student oriented, positive and nurturing, learning environment that promotes understanding and acceptance of diversity in the UC/UCSD community through a broad educational program for UCSD students, staff, and faculty in student oriented human/race relations, cultural pluralism, hate/bias prevention education. It also serves as the campus contact for any student related hate/bias crimes or incidents, and complaints of unlawful discrimination involving UCSD students.

Student Health Service

Mail code 0039
(858) 534-3300
http://studenthealth.ucsd.edu

General medical appointments, some specialty clinics, in-house laboratory and x-ray, as well as health education programs are provided *at no charge* to all registration-paying students during the academic quarters. Summer access to Student Health Service (SHS) is at no additional charge for students with the university student health insurance plans (USHIP or GSHIP). Continuing students waiving USHIP or GSHIP are charged a summer health fee.

Reduced fees are charged for pharmaceuticals, contraceptives, travel immunizations, and laboratory tests sent to our reference lab. If you have USHIP or GSHIP many fees are covered. A Vision Clinic is available at modest fees and offers eye glasses, designer frames, lenses, sunglasses, contacts, and eye exams. If you have USHIP or GSHIP additional discounts apply.

Although undergraduate, graduate, medical, and international students may have unlimited visits with Student Health Service (SHS), students requiring medical or surgical care from practitioners, hospitals, or clinics other than SHS should be prepared to assume the cost of such care.

Starting fall term 2001, the University of California Board of Regents established a requirement that all undergraduate students have mandatory

major medical health insurance as a nonacademic condition of enrollment. The Undergraduate Student Health Insurance Plan (USHIP) provides benefits for ambulance, emergency room, hospitalization, certain outpatient services, surgery, and major medical expenses **with written SHS referral**. USHIP also includes benefits for a dental plan, pharmaceuticals, and intramural, club, and intercollegiate sports. Discounts at the SHS Vision Clinic are included. The cost for USHIP is factored into grants, loans, and work-study programs offered to students who receive financial assistance. Students covered by health insurance meeting certain criteria can ***waive USHIP*** by completing information on *STUDENTLINK* prior to posted deadlines. Only one waiver per year can be filed on *STUDENTLINK*; for additional changes, requests, and information contact the USHIP office at (858) 822-5980. The campus-based insurance plans do not replace the primary medical care and referral services provided by the Student Health Service.

Participation in the *Graduate Student Health Insurance Plan (GSHIP)* is mandatory for all graduate, professional, and international students. GSHIP provides benefits for certain outpatient services, hospitalization, surgery, and major medical expenses by **written referral** of SHS. GSHIP also contains a dental and pharmaceutical benefits and optometry discounts at the SHS clinic. The fee for GSHIP is paid by the university for graduate and professional students holding academic appointments of 25 percent time or more.

Brochures describing these insurance plans, their limitations, exclusions, and open enrollment periods are available at Student Health Service and through the SHS Web page at http://studenthealth.ucsd.edu. The insurance coordinators and are available to assist students:

USHIP Office (858) 822-5980
GSHIP Office (858) 534-2123

Student Policies and Judicial Affairs

Building B, Student Center
Mail code 0329
(858) 534-6225
http://ugr8.ucsd.edu/judicial

Student Policies and Judicial Affairs (SP&JA) consists of the administration of student judicial affairs, which includes campus-wide coordination of student conduct, including graduate students, monitoring of compliance requirements, with applicable federal and state laws, and university policies and campus regulations, such as Right to Privacy as it affects students. In addition, the director also serves as the liaison to Campus Counsel and UC General Counsel for Student Affairs and other student related legal matters and policy questions, and provides advice and recommendations for their disposition. Other programs encompassed by SP&JA include the Student Legal Services Office, Student Office for Human Relations (SOHR), Student Conduct Coordinator, and the Office of Religious Affairs.

Student Legal Services

Building B, Student Center
Mail code 0329
(858) 534-4374
http://sls.ucsd.edu
email: sls@ucsd.edu

Student Legal Services (SLS) provides advice to UCSD students in legal matters. It prepares and drafts legal documents for students seeking to represent themselves in court. These include Petitions for Dissolution, Name Change, Immigration Petitions, and Restraining Orders. Student Legal Services also counsels and prepares students for *in pro per* court appearances, i.e., Small Claims, Municipal, Traffic, and Misdemeanor Arraignment hearings. As SLS cannot represent students, if such representation is deemed necessary the student is referred to an outside attorney or agency specializing in that particular area of the law. SLS conducts twenty legal education workshops on a wide variety of topics each quarter. Additionally, SKS advises Phi Alpha Delta Law Fraternity, the Community Law Project, and the Minority Law Foundation.

Student Safety Awareness and Sexual Assault Resource Center

Main Gym, north side
Mail code 0372
(858) 534-5793
http://www.ucsd.edu/ssap
email: studentsafety@ucsd.edu

The Student Safety Awareness and Sexual Assault Resource Center (SARC) is the primary source of information, crisis intervention, and follow-up support regarding sexual assault, dating violence, and general personal safety on the UCSD campus. The goals of the peer-to-peer education programs for men and women are to dispel myths, to promote awareness of personal violence, and to prevent the incidence of these crimes. The program also explains the victim's options to notify law enforcement and to utilize other resources, i.e., campus and community counseling, and student services. SARC outlines procedures to follow if a sex offense occurs, if a victim reports to law enforcement, and/or uses the on-campus disciplinary process.

University Centers

The facilities, services, and programs of the University Centers at UCSD complement the teaching and research functions of the university. Both the Price Center and the Student Center provide opportunities for students and the campus community to meet, relax, dine, and enhance their experiences outside the classroom or lab.

THE PRICE CENTER

Mail code 0076
Administration office: (858) 534-7666
Web site: theuniversitycenters.ucsd.edu

The centrally located, modern facilities of the Price Center are home to a variety of services geared to the needs of students and the campus community. The Price Center is the place for eating, studying, surfing the Internet, running errands, and catching the latest feature film at the Dolby Digital sound equipped movie theatre. With its computer resources, the Sun God Lounge is a perfect place to study. Services located in the Price Center include the university bookstore, a copy and technology center, a travel agency, a post office, a game room, a Ticketmaster outlet, and a flower stand. Many afternoons, sounds of bands and socializing fill the patio in the plaza. An equally vibrant indoor food court has a variety of fast-service restaurants such as: Wendy's, Subway, Round Table Pizza, Jamba Juice, Star Wraps, Rubio's Baja Grill, Panda Express, and Espresso Roma. A large ballroom hosts major exhibits, conferences, meetings, concerts, and dances throughout the year. Fifteen state-of-the-art conference/meeting rooms are available for use by the campus community. Professional catering and high-tech audio and visual services can also be arranged. The Price Center is also home to many student organizations. In addition, the offices of Campus Tours, Volunteer Connection, Associated Students, University Events, and the Office of Student Organizations and Leadership Opportunities are located in the Price Center.

THE STUDENT CENTER

Student Center Services
Mail code 0323
Administration office: (858) 534-8929
Web site: theuniversitycenters.ucsd.edu

Nestled among the eucalyptus trees, the wood exterior of the Student Center stands in contrast to the modern marble of the Price Center. The casual atmosphere and unique blend of services make the Student Center a special place. The main building is home to The General Store, Groundwork Books, and the Food Co-op. These are UCSD's own brand of student-run cooperatives. The UCSD Guardian newspaper, KSDT radio station, and SRTV are located here along with several student organizations and alternative campus media. The Student Center is a popular study spot with academic services such as A.S. Soft Reserves, A.S. Lecture Notes, and plenty of comfortable outdoor study areas. There are also conference/meeting rooms, two ATMs, and the UCSD Bike Shop, which sells, repairs, and maintains bikes and bike accessories. The Off-Campus Housing Office, which helps students find housing, is located on the second floor. Next to the main building is The Stage at the Pub where dances, concerts, and many other events occur. The Stage is connected to Porter's Pub which serves lunch, dinner, and microbrew beer. Students, faculty, staff, alumni, and community members learn the art of neon, pottery, glass blowing, and other crafts in classes offered at the Crafts Center. The work of artists from around the world is exhibited at the adjacent Grove Gallery. Nearby, specialty coffees, light cuisine, and an occasional musical performance are served up in the patio setting of the Grove Caffe, one of the most beautiful places on campus. Just south of the Student Center on the Revelle campus is the Ché Café, which serves a vegetarian menu at very affordable prices.

STUDENT INFORMATION CENTER (EDNA)

Price Center
Mail code 0076
Administration Office: (858) 534-3362
Web site: theuniversitycenters.ucsd.edu

Located in the Price Center Plaza next to the theatre lobby, the information desk serves the campus community by providing information and a variety of other services benefiting the students, faculty, and the general public.

STUDENT GOVERNMENTS

Associated Students
Third Floor, Price Center
Mail code 0077
A.S.: (858) 534-4451
Hours: 8:00 a.m.– 4:30 p.m. Monday–Friday
http://as.ucsd.edu
Graduate Student Association
Student Center A
First Floor, room 132
Mail code 0353
GSA: (858) 534-6504
Hours: 9:00 a.m.–5:00 p.m. Monday–Friday
http://weber.ucsd.edu/~gsa

The Associated Students (A.S.) and the Graduate Student Association (G.S.A.) provide students with practical leadership experience in the areas of programming, financial planning, lobbying, and in the development of programs and services that are designed to meet the students' needs. The Associated Students (A.S.) operates A.S. Lecture Notes, A.S. Soft Reserves, A.S. Microwave/Refrigerator Rentals, A.S. Volunteer Connection, A.S. Undergraduate Scholastic Grants, A.S. Triton Taxi, A.S. Academic Success Program, A.S. SRTV, KSDT radio, Grove Caffe, and the Holiday Airport Shuttle. The A.S. has an official liaison with the A.S. Student Initiated Outreach and Recruitment Commission (SIORC), A.S. Alliance, A.S. Women's Commission, A.S. Triton Tide, and the A.S. All-Campus Transfer Student Association. The A.S. also sponsors a wide variety of programming, including speakers, concerts, and festivals.

The G.S.A. takes a proactive stance on graduate concerns in the areas of housing, TA/RA work-related issues, and mandatory health insurance. The Student Government staffs work with the A.S. and the G.S.A. in providing logistical, accounting, and programmatic advice. The student leaders and the staff of the A.S., the G.S.A., and the Student Government Services office encourage you to get involved and take part in the many leadership opportunities available at UCSD.

University Events Office

Price Center
Mail code 0078
(858) 534-4090
http://ueo.ucsd.edu

The University Events Office is a professional presenting organization and a central resource for programming of events and activities at UCSD. The office hosts over fifty events annually. It provides the campus and community with programs in the areas of internationally acclaimed dance, music, drama, chamber music, popular entertainment, and the San Diego International Film Festival. All programs are presented in conjunction with student committees, and volunteers are welcome.

The staff is a central resource for programming advice and assistance in the areas of event planning, publicity, marketing, ticket handling, and contracting. The management of the Central Box Office provides for the sale of tickets to most campus events as well as tickets sold on the Ticketmaster system to events in town and around the country.

STUDENT ORGANIZATIONS AND LEADERSHIP OPPORTUNITIES

Price Center
Mail code 0078
(858) 534-0501
http://solo.ucsd.edu

The office of Student Organizations and Leadership Opportunities strongly supports the notion that the university must provide learning experiences for students both within and outside the classroom. Participating in leadership workshops, seminars, conferences, and in any of the over 300 student organizations is an integral part of the university experience. With so many organizations to choose from, there is bound to be one that sparks individual interest. If not, students can start their own organization! Registration for student organizations begins in the fall and continues throughout the academic year. The advisers are here to assist in selecting an organization or in starting one.

In addition, leadership seminars are organized to help strengthen the leadership potential of students. Listed below are some of the training programs we schedule each year:

- Improving interpersonal skills
- Public relations
- Interviewing techniques
- Fund raising
- Team building
- Running effective meetings
- Time management
- Careers in student affairs
- Budget management

Motivation
Stress management
Ethics
Publicity/advertising
Recruiting volunteers
Diversity

We invite you to stop by the Student Organizations Center on the third floor of the Price Center to learn more about student organizations and leadership opportunities!

Veterans' Affairs

Building 201 University Center
Mail code 0013
(858) 534-4480
http://www.ucsd.edu/finaid

ELIGIBILITY

The following persons may be eligible for federal veterans' educational benefits:

Chapter 35

1. Sons, daughters, spouses, and surviving spouses of veterans who died, or are permanently and totally disabled as the result of a service-connected disability, or persons missing in action, or captured in line of duty by a hostile force.

Chapter 30

2. A person who entered active duty for the first time after June 30, 1985, and served continuously for three years.

Chapter 106

3. Persons who have a six-year obligation to serve in the Selected Reserve signed after June 30, 1985.

Attention Veterans:

All VA recipients must submit a degree check from their college to the Veterans' Affairs Office at Financial Aid. (After the add/drop date for spring.)

CalVet Fee Waiver

4. California Veterans' Dependents College Fee Waiver Program: A student who is the child of a deceased veteran or veteran with a service-connected disability may receive a waiver of registration and educational fees. Eligibility is determined by individual county veterans' services offices.

OTHER SERVICES

In addition to certifying paperwork to initiate a student's veterans' benefits, the Student Financial Services staff can answer questions about check problems or other programs administered by the Veterans Administration such as tutorial assistance and VA work-study, or can provide you a phone number so that you can make an inquiry to the Veterans Administration Regional Office.

Upon admission to the university, please contact the Student Financial Services Office to request certification of VA educational benefits, or notify the office of your eligibility for the CalVet waiver.

Other Services and Programs

UCSD Alumni Association

202 University Center
Mail code 0083
(858) 534-3900
email: alumni@ucsd.edu
http://www.alumni.ucsd.edu

The UCSD Alumni Association was formed in 1964 by a small group of early graduates, and it has grown today to represent over 95,000 alumni. Our mission is to foster a lifelong, mutually beneficial relationship of alumni and students with UCSD. The association works to provide alumni with continued access to the resources of the university, communicate UCSD news and happenings, and facilitate a network for alumni and student interaction.

The Alumni Association awards undergraduate scholarships, recognizes outstanding alumni, faculty, and students, assists the university with legislative advocacy, and brings alumni together in social, educational, and networking forums in San Diego and across the nation. The association publishes *@UCSD* magazine and hosts an active online community.

Increasingly, the Alumni Association is providing current students with access to alumni as a resource for social, career, and community connections. When students become members of the association they maximize their interaction with this larger community of alumni. Offerings include career mentoring, skills development training, and support for student organizations and activities.

Student and alumni members have access to campus discounts and privileges, networking and volunteering opportunities, educational travel programs, a subscription to all alumni publications, and discount cards for UCSD and community activities.

Art Galleries

UNIVERSITY ART GALLERY

Mandeville Center, Room 101
Mail code 0327
(858) 534-2107
http://www.universityartgallery.ucsd.edu

The University Art Gallery presents four exhibitions each year with an emphasis on contemporary works. Painting, sculpture, and photography are joined by newer art forms such as performance art, installation works, and video art, giving visitors a chance to experience the full range of contemporary artistic expression. Recent exhibitions have included: Edward Burtynsky and Stéphane Couturier, *Altered States: Landscape Transformations in the Wake of Progress;* Doug Hall, *In Finite Spaces;* and Eleanor Antin, *The Last Days of Pompeii.*

Gallery hours are from 11:00 a.m. to 4:00 p.m., Tuesday through Saturday. The gallery is closed Sundays, Mondays, and school holidays. There is no admission charge.

MANDEVILLE ANNEX GALLERY

Mandeville Center, Room B-118
Mail code 0327

The Mandeville Annex Gallery is for Visual Arts undergraduate art exhibitions. A new exhibition is mounted each week of the quarter. Included in the exhibition schedule are individual, group, and class shows. Gallery hours are from 12:00 noon to 5:00 p.m., Monday through Friday. There is no admission charge.

VISUAL ARTS GRADUATE GALLERY

Visual Arts Facility, Room 309
Mail code 0084
http://visarts.ucsd.edu

The six-building complex houses the Visual Arts Graduate Gallery. First-year review shows and M.F.A. exhibitions will be mounted each week of the quarter. Gallery hours are from 12:00 noon to 5:00 p.m., Monday through Friday. There is no admission charge.

Child Development Center

Mail code 0962
(858) 534-2768
http://admissions.ucsd.edu

The UCSD Early Childhood Education Center serves the children of students, staff, faculty, and the community at large. Age requirements are eleven months and walking through kindergarten. State subsidy is available for income-eligible staff and full-time students on a limited basis. Only full-time enrollment is offered, 7:30 a.m. to 5:00 p.m., Monday through Friday. Breakfast, lunch, and afternoon snack are included in the cost. For further information or to visit, call the Childcare Center's office at (858) 534-2768 between 7:30 a.m. and 5:00 p.m.

As an alternative, the Infant Toddler Referral Program aids campus families in locating licensed home-care providers for children from six weeks through preschool ages. For assistance, call (858) 534-2768 during office hours or leave a recorded message for a return call.

Crafts Center

Mail code 0338
(858) 534-2021
http://www-crafts.ucsd.edu

Located in the center of the campus, the Crafts Center offers studio and art/crafts instructional facilities in ceramics, photography, jewelry, drawing, neon, glassblowing, and other crafts. The center provides personal enrichment and creative educational opportunities to individuals wishing to develop artistic skills in an active studio-classroom situation.

The Grove Gallery is a part of the center, and offers ongoing exhibits of contemporary crafts and ethnic arts. The Grove Gallery Store sells an international selection of handmade crafts and other decorative accessories.

Registration for Crafts Center activities takes place the first week of every quarter at the center. Specific classes, schedules, and course fees information can be obtained by calling (858) 534-2021 or http://www-crafts.ucsd.edu.

UCSD Cross-Cultural Center

Building 510, Mail Code 0053
(858) 534-9689, Fax (858) 822-0173
cccenter@ucsd.edu
http://ccc.ucsd.edu

Established in May of 1995, the UCSD Cross-Cultural Center (CCC) functions as a campus community center committed to creating space for dialogue while also maintaining an environment conducive to the recruitment and retention of students, staff, and faculty from underrepresented backgrounds.

The CCC offers programs and services specifically designed to reflect UCSD's commitment to excellence, scholarship, and community through cross-cultural interactions. The center's focus areas include: faculty, staff, and student exchanges, educational materials and resources, student outreach and retention activities, speakers, film series, community outreach, support and discussion groups, and leadership development.

Imprints

http://imprints.ucsd.edu

YOUR UCSD PRINT RESOURCE CENTER

Self-serve copies, full color copies, fax service, posters, lamination, large format, plus a large variety of other printing and binding services are available. Price Center Imprints is open evenings and weekends. In addition to standard services, computer workstations are available on a rental basis with both black and white and color laser printer options.

Campus Locations:

- Applied Physics and Math Bldg., Room #3301, (858) 534-2197
- Campus Services Complex, Bldg. A, (858) 534-3020
- Geisel Library, Main Flr (858) 534-2534
- Price Center, Upper level (858) 822-4422
- University Center, Bldg. 201, (858) 534-7050

Triton Plus Card, Library photocopy card, cash, and check payment accepted. Visa and Mastercard accepted at Price Center and Geisel Library locations.

Transportation and Parking Services

Located in the Gilman Parking Structure
Mail code 0040
(858) 534-4223
http://parking.ucsd.edu

Transportation and Parking Services, (T&PS) sponsors a variety of programs and services designed to help students living at UCSD without a car. An extensive network of shuttles spans the campus and also serves several off-campus locations. A special sticker can be affixed to a UCSD ID card, free of charge, allowing unlimited rides on San Diego Transit buses within a two-mile radius of campus. T&PS offers a free holiday shuttle service to the airport, helping students get home during breaks. For information, route maps, or schedules, please telephone (858) 534-RIDE, or check our Web site at *parking. ucsd.edu*.

A number of money-saving rideshare programs have been developed for commuting students. Carpool, vanpool, rail, bicycle, and subsidized transit programs feature terrific additional incentives including a free emergency ride home and complimentary parking. For program details, call Rideshare Operations at (858) 534-RIDE.

If you choose to bring a car to campus, be aware that a parking permit is required on UCSD property, Monday through Friday, 7:00 a.m. to 11:00 p.m., unless otherwise posted. (A short grace period during September's Welcome Week allows parking in student spaces without a parking permit.) Parking permits can be obtained at the Parking Office (858) 534-4223, or by accessing StudentLink.

Student spaces are defined by yellow squares, student ("S") parking permits are valid in these yellow spaces at all times. After 4:30 p.m. weekdays, all UCSD permits are upgraded and become valid in spaces marked with green ("B") or red ("A") squares, and metered (no fee required) spaces. Permits are not required on campus Saturday and Sunday, unless otherwise posted. Student permits are never valid in spaces marked *"A" Permit Required, 24 Hours a Day, 7 Days a Week*, or in any other 7/24 parking space.

T&PS has a Motorist Assistance Program which provides battery jumps, help with lock outs, flat tire inflation, or a lift to the nearest station to buy gas for drivers stranded on campus. Call (858) 534-8108.

If you have questions about T&PS, purchasing a permit, or parking at UCSD, please telephone a service representative at (858) 534-4223, visit our Web site: parking.ucsd.edu or stop by the Parking Office, located in the Gilman Parking Structure (entrance on Russell Lane).

Student Mail Services

Campus Services Complex, Bldg. A
Mail code 0047
(858) 534-7098
http://www-bfs.ucsd.edu/mails/

The Student Mail Services provides Monday through Friday distribution of mail to resident students during the academic year. Hours of operation are 8:00 a.m. to 4:00 p.m. Stamps and various other U.S. Postal commodities can be purchased.

The UCSD Bookstore

Located in the Price Center Complex
9500 Gilman Drive
La Jolla, CA 92093-0008

Monday–Friday 8:00 a.m.–6:00 p.m.
Saturday 10:00 a.m.–5:00 p.m.
Open most Sundays 12:00 noon–5:00 p.m.
For holidays and extended hours at the beginning of each quarter, phone or check: bookstore.ucsd.edu

- *Course Materials/Textbook Adoption* Requisitions: ucsdbkst.ucsd.edu/books/textbooks/adoptionform.htm
- Course Materials/Textbook Reservation Service (TRS) for fall quarter: bookstore.ucsd.edu/trs

	(858)
General Information	534-READ
Birch Aquarium Bookshop	534-8753
Clothing & Gifts	534-8530
Computer Center	534-4291
Computer Repair	534-4291
Course Materials/Textbook Department	534-4557
Custom Publishing	534-7963
Digital Course Content	534-5291
Electronics Department	534-3786
Medical Instruments	534-7057
Refund/Recharge	534-7326
Sunshine Store/Film	534-2875
Supplies Department	534-3786
Toll Free	(800) 520-7323
Trade and Professional Book Information	534-3149
Fax Numbers	
• General Number	534-0565
• Computer Center	534-1430
• Book Departments	534-5286
• Supplies & Clothing	534-0410
Web site	bookstore.ucsd.edu

Delivery Locations

The bookstore will consider special delivery to other areas not listed below. Call them with your request.

Scripps Institution of Oceanography/all areas
UCSD Medical Center Hillcrest within 10 mile radius
UCSD Medical Center La Jolla
UCSD residence halls/all colleges
Shiley Eye Center
Ratner Children's Eye Center
La Jolla Professional Center
VA Hospital in La Jolla
Salk Institute (receiving department only)
The Scripps Research Institute (receiving department only
Torrey Pines Centers North and South
Naval Medical Hospital Balboa Park
Companies situated along North Torrey Pines Road
Children's Hospital
Preuss School
Sorrento Mesa Extension Complex
Rancho Bernardo Extension Complex

Course Materials/Textbooks

Required and recommended course materials for undergraduate and graduate classes are stocked at the UCSD Bookstore, along with additional supplementary study aids.

Course materials for UCSD Extension courses are stocked in the Extension section of the UCSD Bookstore; they can also be ordered online via the Bookstore's Web site at http://bookstore.ucsd.edu/books/extension/index.htm. Extension course materials ordered via the Web may be shipped, held for pick-up in La Jolla, or delivered for pick-up at the North County or Sorrento Mesa Extension centers.

Online Look-Up: Undergraduate, graduate, and Extension course materials lists, along with prices and availability, may be viewed on the World Wide Web the same day they are entered into the Bookstore's database once the feature is activated for each term. For graduate and undergraduate classes, within the Schedule of Classes on UCSD's StudentLink, click on the blue book icon for the desired section. For Extension course materials lists, use the look-up/purchase feature at http://bookstore.ucsd.edu/books/extension/.

Faculty: Each quarter, the UCSD Bookstore sends a memo to faculty requesting course materials information ("adoptions") for the upcoming quarter. Faculty can submit adoptions directly to the Course Materials Department at the UCSD Bookstore, through the various academic departments, or via the Bookstore's Web site at http://bookstore.ucsd.edu/books/textbooks/coursematerials.htm. Faculty should submit their adoptions before the quarterly deadline to ensure that the course materials can be stocked before classes begin. Information about and links to other campus instructional support services (library eReserves, course Web pages, A.S. Soft Reserves, Imprints, etc.), are at http://coursematerials.ucsd.edu/.

Course Materials/Textbook Reservation Service (TRS)

At the beginning of every fall quarter, the UCSD Bookstore offers a convenient course materials/textbook reservation service (TRS). Students can submit reservations using the special form each entering student receives in the mail and in an orientation packet, or via the Bookstore's Web site at http://bookstore.ucsd.edu/trs.

Custom Publishing

As part of the UCSD Bookstore's mission to serve the UCSD community as an essential academic resource, the course materials department provides custom-printed course materials, including out-of-print and out-of-stock books, journal and newspaper articles, syllabi, anthologies, lab manuals, and original works. To ensure compliance with legal requirements involving reproduced printed materials, the Bookstore secures all necessary copyright permissions. Faculty should submit adoptions for custom-printed materials along with their other adoption requests.

Digital Course Content

Unique in the college bookstore industry, the UCSD Bookstore has a staff member dedicated to digital course content delivery. Acting in concert with other instructional support departments on campus, the Bookstore can assist faculty in locating digital materials and making them available to UCSD students.

Course Materials/Textbook Buyback

During the first week and finals week of each quarter, the UCSD Bookstore provides a buyback

service allowing students to sell their textbooks for cash. If a title is being used in the upcoming term, students may receive up to half the new price of the book.

Book Information

The book information department's experienced staff of booksellers can help find just the right book from among the impressive selection of general, technical, scientific, and medical books stocked at the UCSD Bookstore. Booksellers can also research any title that is in print in the United States by accessing databases that contain information on hundreds of thousands of additional titles. They are happy to special order books that are not available in the store. In addition to offering in-store service, booksellers take orders and answer inquiries via phone, fax, and email and can assist with searching for books and placing orders on their Web site: bookstore.ucsd.edu, which shows availability of more than 140,000 titles contained in their database. To search for and order from more titles, the Bookstore offers two additional Web sites: BookSense, for trade and technical books and the UCSD medical Web store for medical books.

General, Scientific, and Technical Books

The general, scientific, and technical department contains books from hundreds of different publishers. To support the academic mission of the university, a wide array of academic disciplines in the arts and humanities, social sciences, languages, mathematics, science, and engineering are represented. Strong general interest sections in categories such as fiction, travel, reference, and children's books complete the selection. Find excellent values in the bargain books section and on discounted bestsellers. All general, scientific, and technical books are discounted 10 percent during "Happy Hours" from 4:00 p.m.–6:00 p.m. every Wednesday. Check availability of titles in the store online at bookstore.ucsd.edu. The home page provides the opportunity to search and order from among two million additional titles, and explore their partner stores, BookSense for trade and technical books, and the UCSD medical Web store for medical books..

Medical Books and Instruments

The UCSD Bookstore is proud of its partnership with the medical community at the university and in the San Diego area. It has long been recognized as the primary resource for an up-to-date, comprehensive selection of medical books and instruments. In the store, find medical textbooks for the UCSD School of Medicine and UCSD School of Pharmacy along with more than 5,500 reference titles in nearly one hundred medical categories. A large selection of medical instruments is available along with lab coats, clinical jackets, scrubs, and unique medical gift items. All medical books and instruments are discounted 5 percent during "Happy Hours" from 4:00 p.m.–6:00 p.m. every Wednesday. Check availability of medical titles in the store online at bookstore.ucsd.edu. For a larger selection of medical titles, search the UCSD medical Web store accessed from the home page. This Web site features more than 90,000 titles and offers up to a 5 percent discount on medical and nursing books as well as medical supplies and instruments.

Faculty Authored Books

The UCSD Bookstore is pleased to display and sell recent publications authored by UCSD faculty. Inside the bookstore find books shelved in a special Faculty Author section and in the categorical section that applies. Look for a selection of recently published titles on display at the Faculty Club. Faculty members with a new book they would like the UCSD Bookstore to stock should contact the store using one of these methods: (858) 534-3149; (800) 520-7323; bookstore.ucsd.edu and click on the Visitors and Friends tab and provide the title, publisher, and ISBN number.

Gifts and Clothing

Visit the gifts and clothing department and discover an exciting selection of UCSD insignia merchandise, as well as seasonal, trendy, and everyday clothing and gift merchandise. You can shop for bath and body products as well as home décor, jewelry, and sandals. In-store events for this department include the spring break sale, grad fair, and holiday sale, all of which bring a mini mall shopping experience to campus. Shop online: bookstore.ucsd.edu/clothing, or call to find out about the latest arrivals, (800) 520-7323 (READ).

Supplies: School, Art, Office, and Residence Halls

The bookstore caters to UCSD's office, school, art, and residence hall supply needs as well as professor required art, engineering, and lab supplies. Students living in the residence halls have a selection of linens, towels, shower caddies, picture hangers, trash cans, white/cork boards, extension cords, T.V. cables, batteries, and much more to get their rooms set-up in style. Call (858) 534-3786 for a copy of the Super Catalog featuring over 30,000 office, art, school, and residence hall supplies. Special orders are easy to place and usually arrive within one to two days. For some of the most common supplies, shop online: bookstore.ucsd.edu/supplies.

Electronics

Brand name calculators, CD players, and voice recorders such as Hewlett Packard, Texas Instruments, Sharp, Sony, and Panasonic are always in stock at the bookstore. This department is full of fun and useful gadgets and accessories.

Computers

The extremely knowledgeable staff of the UCSD Bookstore computer department is available to assist those who wish to purchase computer and printer hardware and accessories. Educational pricing is offered for full-time UCSD students, extension students (certificate courses), faculty, and staff on Macintosh and PC software and hardware. Special orders are encouraged for products that may not be stocked. The UCSD Bookstore One Stop Shopping (BOSS) system was created to allow ordering computer products online: bookstore.ucsd.edu/computers/index.htm.

Computer Repair

At very reasonable prices the bookstore's computer center repair shop accepts in-warranty repairs for: Apple, Dell, Gateway, and Compaq commercial laptop.

In adddition, they repair almost all out-of-warranty computers and printers including PC clones. They do not repair out-of-warranty monitors. To receive service bring your system to the bookstore computer center. The average repair is 3–5 days.

Special Orders

Books, gifts, clothing, office and art supplies, medical instruments, computer hardware and software can be special ordered at any time. Call us to request a personal shopper.

BIRCH AQUARIUM AT SCRIPPS BOOKSHOP

2300 Expedition Way
La Jolla, CA 92093-0207
Monday–Sunday 9:30 a.m.–5:00 p.m.

(858) 534-8753
(Closed Thanksgiving Day, Christmas Day, and New Year's Day)

The Aquarium Book and Gift Shop has been operated by the UCSD Bookstore since August 1994. Its goal is to support the education and community service missions of the Scripps Institution of Oceanography and the Birch Aquarium at Scripps. The bookshop has an exciting selection of educational books concerning the geological, biological, and physical sciences and how they interact with the sea. A dazzling variety of children's books and educational toys are available to children of all ages who have interest in the ocean and its marine life. Other popular items are guides to scuba diving and snorkeling, tide pool guides, San Diego tourist guides, and maps. The bookshop's selection of souvenirs and gifts is fun-loving with a wide-ranging selection of T-shirts, sweatshirts, postcards, calendars, video tapes, stuffed animals, jewelry, and lots more. Visit the Web store at bookstore.ucsd.edu/aquarium.

THE SUNSHINE STORE

Monday–Friday 7:00 a.m.–8:00 p.m.
Saturday 9:00 a.m.–5:00 p.m.
Most Sundays 12:00 noon–5:00 p.m.

Visit the Sunshine Store for all your favorite groceries and needs including: frozen, microwavable, and packaged meals, snacks, soda, juice, coffee, tea, ice cream, sandwiches, donuts, candy, international foods and snacks, health and personal products, cleaning supplies, and household essentials. Film and film processing are available with specials running throughout the year. Join the Coffee Club (buy ten cups, get the eleventh cup free)! Library-safe mugs are sold here, as well as scantrons, blue books, batteries, daily newspapers, and munchies when everything else is closed on campus! Established in April 1979 as an auxiliary operation of the UCSD Bookstore, the Sunshine Store is a busy annex located next to the UCSD Bookstore on the ground floor of the Price Center plaza.

RETURN/REFUND POLICY

The UCSD Bookstore strives for complete customer satisfaction. Should any product you select from the UCSD Bookstore fail to meet your expectations, they will respond to your concern and assist you in an exchange, refund, or credit whenever possible within the guidelines that apply to their specific merchandise categories.

- All categories of refundable merchandise require an original receipt to obtain a refund.
- Undergraduate, graduate, and Extension textbooks must be accompanied by the cash register receipt and meet the conditions and timeframes printed on the bookmark that accompanies the receipt.
- Books used for School of Medicine and School of Pharmacy and Pharmceutical Sciences courses must be returned within 14 days from the date on the receipt.
- General interest, technical, and medical books may be returned for refund, exchange, or credit within 14 days if they are in resalable condition and are among the titles currently carried in the UCSD Bookstore.
- Nonrefundable/nonexchangeable merchandise: medical instruments, Medical (MDTEST), other testing (REFEXM) books, magazines, and clearance books.
- Computer hardware and software refund policies are available in the computer department.
- For supply department electronics, original packaging and cash register receipt are required for refund or exchange.

University Police Department

Building 500 University Center
Mail code 0017
EMERGENCY, DIAL 9-1-1
Business, (858) 534-4357
http://police.ucsd.edu

The UCSD Police Department protects life and property through the enforcement of local, state, and federal laws. The police department strives for a safe campus environment, where the educational and research pursuits of the university can be realized.

The Police Department provides continuous twenty-four-hour-a-day police patrol to protect the campus community, along with the dispatching of emergency fire and ambulance services.

In addition, student residential areas are provided with additional security with on-site residential security officers (RSOs) during the evening and early morning hours.

CLERY CAMPUS CRIME REPORT

For information concerning campus crime statistics, crime reporting, policies and practices pertaining to campus security, and/or crime prevention tips, please visit the UCSD Police Department's Web site—Crime/Victim Information located at www.police.ucsd.edu.

CRIME PREVENTION PROGRAM

(858) 534-3644

The Police Department's Crime Prevention Program offers a variety of information to the campus community on crime prevention methods. Pamphlets and informative seminars are available.

COMMUNITY SERVICE OFFICER PROGRAM

(858) 534-9255

CSOs are students employed by the UCSD Police Department. They provide a variety of services related to crime prevention and campus safety. One of the services is the safety ESCORT program, which is available every evening from 5:00 p.m. to 1:00 a.m. They also provide security for campus events and facilities. For more information contact the program coordinator at (858) 822-1130.

LOST AND FOUND

(858) 534-4361

The Police Department serves as a central repository for lost and found articles. Lost and found items should be taken to the police station. The station is open twenty-four hours daily.

U.S. Neighborhood Post Office

2.425 Price Center
Mail code 0047
(858) 534-1164
http://www-bfs.ucsd.edu/mails/

The Price Center Post Office is a contract station operated under the rules and regulations of the U.S. Postal Service. Stamps, money orders, and other postal items may be purchased and mailed at this location Monday–Friday, 8:30 a.m. to 5:00 p.m. P.O. Box rentals are available in various sizes.

Research at UCSD

Organized Research Units (ORUs) are academic units the University of California has established to provide a supportive infrastructure for interdisciplinary research complementary to the academic goals of departments of instruction and research. The functions of ORUs are to facilitate research and research collaborations; disseminate research results through research conferences, meetings, and other activities; strengthen graduate and undergraduate education by providing students with training opportunities and access to facilities; seek extramural research funds; and carry out university and public service programs related to ORUs' research expertise. The senior staff of these units are faculty members in related academic departments. Institutes and centers currently in operation at UCSD are described below.

In addition, the university is formally and informally affiliated with various private research organizations such as the Institute of the Americas, The Salk Institute for Biological Studies, Howard Hughes Medical Institute, Ludwig Institute for Cancer Research, and The Burnham Institute.

Universitywide Institutes/ Organized Research Units

California Space Institute (Cal Space) was established in 1979 as a multicampus organized research unit of the University of California (UC). Cal Space maintains centers on several campuses, which support and conduct pure and applied space-related science and technological research and development. Specific areas of investigation include the following:

Remote Sensing–acquisition, processing, and application of observations by satellites or other remotely automated instruments to study the Earth and its changing environment. The primarily satellite-based investigations study the greenhouse effect, global warming, hydrological cycle, land surface processes, air-sea interactions, radiation, and cloud dynamics.

Climate–interdisciplinary scientific research that applies space observations and numerical modeling techniques to fundamental issues of climate prediction and global change caused by both natural and human forces within the atmosphere, the oceans, and on land surfaces.

Space science and engineering–investigations of both the solar system and universe, and the development of automation and robotic systems for space exploration. Current investigations include the study of comets, asteroids, the solar wind, and cosmic background radiation. Space observations are often conducted with instruments and techniques designed by Cal Space researchers.

Education–promotion of undergraduate and graduate education in the interdisciplinary fields of climate and global change, and space science and engineering. The Cal Space-led state-wide consortium (California Space Grant Consortium) was designated in 1989 as a Space Grant College by NASA's Office of Education. The program expands leadership in the development and application of space resources through research and hands-on space projects, fellowship funding, and educational outreach activities. The California Space Grant Program works with NASA Centers and the aerospace and high technology industries to strengthen its educational objectives.

Institute of Geophysics and Planetary Physics (IGPP) was established in 1960 and named the Cecil H. and Ida M. Green IGPP in 1994. It is a multicampus research unit of the University of California, headquartered at UCSD, with branches at UCI, UCLA, UCR, UCSC, as well as Los Alamos and Lawrence Livermore National Laboratories. The present facility includes the Roger and Ellen Revelle Laboratory and the Judith and Walter Munk Laboratory. Present research concentrates on the study of crustal dynamics by measurements of gravity, tilt, displacement, and strain in both continental and oceanic environments; of regional seismicity and linear and nonlinear earthquake and explosion source mechanisms; of the variability of the earth's geomagnetic field and its generation by the geodynamo; of the spherical and aspherical structure of the earth by measurements of free oscillations, surface waves, and travel times; of seafloor tectonics using marine geophysical methods; of linear and nonlinear theoretical and computational fluid dynamics; of the variable mesoscale structure of the oceans and global ocean warming by acoustic tomography; of the structure of the oceanic crust and lithosphere by seismic and electromagnetic measurements on the ocean bottom and at the ocean's surface through seismic multichannel methods; of sea-floor and planetary topography and gravity using satellite methods; of nonlinear dynamics applied to geomorphology; and of tides, waves, turbulence, and circulation in the oceans; of surface change caused by tectonic activity, or climate change using satellite Interferometric Synthetic Aperture Radar (InSAR), as well as airborne and spaceborne laser altimetry. The institute operates a global network of some forty broadband seismometers, the IDA (International Deployment of Accelerometers) Array, with ten of these stations in the former Soviet Union which are telemetered by satellite to the institute; a crustal strain and seismic observatory at the Cecil and Ida Green Piñon Flat Observatory near Palm Springs; a scientific wireless network in California with SDSC, the High Performance Wireless Research and Education Network (HPWREN); a southern California network of Global Positioning System (GPS) satellite geodetic sites operated by the Scripps Orbit and Permanent Array Center (SOPAC) and the California Spatial Reference Center (CSRC); an acoustic network in the Pacific for measuring ocean temperature variability; a modern 3D data visualization facility; a 5m, X-band satellite receiving antenna for satellite remote sensing; a national Ocean Bottom Seismograph Instrument Pool (OBSIP); and telemetered seismic arrays in Kirghizia, and two locations in California. The institute does not grant degrees, but makes its facilities available to graduate students from various departments who have chosen to write their dissertations on geophysical problems. Undergraduate students are involved in independent research projects and as laboratory assistants. Members of the institute staff now hold joint appointments with the Departments of the Scripps Institution of Oceanography, and Applied Mechanics and Engineering Sciences. Support for visiting scholars and grant matching funds is provided through an endowment to the Cecil and Ida Green Foundation for the Earth Sciences.

The **University of California Institute on Global Conflict and Cooperation (IGCC)** is a multicampus research unit serving all ten UC campuses and the UC-managed Lawrence Berkeley, Lawrence Livermore, and Los Alamos National Laboratories. IGCC is based at the Graduate School of International Relations and Pacific Studies (IR/PS) at UCSD, whose faculty provides IGCC's leadership.

IGCC's mission to educate the next generation of international problem-solvers and peacemakers is carried out through teaching activities and research and public service opportunities. Scholars and researchers from inside and outside the UC system, government officials, and students from the United States and abroad have participated in IGCC projects.

IGCC's initial research focused on averting nuclear proliferation through arms control and confidence-building measures between the superpowers. Since then, its research program has diversified to encompass several broad areas of inquiry: regional relations, international environmental policy, ethnic conflict, terrorism, and international trade and policy issues. In addition, receipt of a prestigious NSF award in 2002 for a program to train the next generation of nuclear policy experts has lead to a rekindling of interest in research on traditional security issues.

IGCC supports research and teaching on the causes of international conflict and opportunities to promote cooperation through its annual fellowship and grant cycle. IGCC's development office provides an additional resource for UC aculty seeking foundation funding for their projects. IGCC also serves as a liaison between the academic and policy communities through its Washington, D.C. office, located in the UC Washington Center (UCDC). The Washington, D.C. office administers a graduate internship program in international affairs and the IGCC Dissertation/Foreign Policy Fellow Program. Interns and fellows are placed with governmental and nongovernmental organizations involved in international policy. The Washington office also sponsors policy seminars to showcase UC faculty research results and to provide opportunities for interaction between professors and policymakers.

IGCC's annual **NEWS***Wired* provides an overview of the previous year's research, funding, awards, projects, meetings, workshops, colloquia, news, and publications. **POLICY***Packs* provide concise summaries of IGCC research programs for the policy community. A new annual journal, **IGCC***Review*, will feature articles addressing the policy implications of IGCC research conducted by senior UC faculty.

IGCC receives primary support from the regents of the University of California. Additional funding has been provided by the U.S. Departments of Energy, State, and Defense, the U.S. Institute of Peace, the National Science Foundation, the Japan-U.S. Friendship Commission, and Japan's National Institute for Research Advancement (NIRA). IGCC has also received important support from foundations such as the Japan Foundation Center for Global Partnership (CGP), the Carnegie Corporation of New York, The John D. and Catherine T. MacArthur Foundation, the William and Flora Hewlett Foundation, the Markle Foundation, the Smith Richardson Foundation, and the Rockefeller Foundation.

For more information about IGCC and its research programs, including full-text publications and downloadable **POLICY***Packs*, visit the IGCC Web site at http://www-igcc.ucsd.edu. IGCC publications can also be downloaded from the California Digital Library's E-Scholarship Repository at http://repositories.cdlib.org.

The White Mountain Research Station (WMRS) was established as a UC multicampus research unit in 1950 to support high altitude research. The station includes 4 laboratory facilities located over a 3,000m (10,000 vertical ft.) altitude transect, ranging from the floor of the Owens Valley to the highest peak in the White/Inyo Mountains. Located on the western edge of the Great Basin, WMRS also provides access to three major biogeographic regions (Sierra Nevada and White/Inyo montane, Mojave desert and Great Basin desert), and geologically rich and diverse field sites. WMRS has evolved into a major multidisciplinary research and teaching institution in eastern California, and hosts programs in archaeology and anthropology, atmospheric and space sciences, biological and medical sciences, ecology, conservation and natural resource management, geological, hydrological, and earth sciences.

WMRS facilities include: (1) the business office, laboratories, classrooms, dormitories, and dining hall for up to seventy people in Bishop, (2) a newly renovated lodge, cabins, and classroom laboratory at Crooked Creek (3,094m altitude), which accommodates up to fifty people, (3) the Nello Pace Laboratory and Mount Barcroft facilities (3,801m altitude) which accommodate thirty-five people in dormitories, and (4) the 450 square foot Summit Laboratory located on White Mountain peak (4,342m altitude), which is the highest research lab in North America.

The Bishop facilities includes wet and dry labs, a modern biology laboratory, The Deepest Valley Interagency Plant Propagation Center, and a geographic information system (GIS) laboratory that houses the USGS-funded "Eastern Sierra Geospatial Data Clearinghouse." This is used by visiting researchers and local agency scientists, as well as off-site investigators and policy makers via World Wide Web access.

WMRS hosts more than 3,000 users from over 100 institutions per year for research, teaching, and conferences. WMRS also hosts a Center for Astrophysics and Cosmology at Barcroft. Research occurs year-round with access to the high-altitude labs at Barcroft via snowmobile. Summer is the busiest time at WMRS, with undergraduate internships, graduate students supported by WMRS Fellowships in residence, plus students and faculty from other universities around the world. Educational uses include several geology field courses and a course on Integrated Methods in Ecology with the undergraduates in residence for the spring quarter. WMRS sponsors professional and post-graduate training courses, annual professional society meetings, and offers published proceedings from symposia on the environmental science in the region.

Campuswide Institutes

The AIDS Research Institute
http:// ari.ucsd.edu/index.html

Established in 1996 and formally opened in 1997, the AIDS Research Institute (ARI) serves as the conduit for the UCSD Programs in HIV Infection and AIDS, in which AIDS researchers in all university departments and our associated institutions can collaborate on research, with the objective of developing new approaches to the prevention, diagnosis, and the treatment of HIV/AIDS.

UCSD faculty have made major advances in our understanding of how the virus works, how it causes disease, how to treat HIV infection and its complications, and the impact of HIV infection on nationwide health and healthcare costs. In addition to the 104 faculty members from 19 departments, the UCSD Program in HIV Infection and AIDS is internationally recognized for its contributions to science and patient care, bringing in more than $30 million in HIV and AIDS-related grants annually and is ranked among the top ten AIDS programs in the country.

ARI programs include:

- The Center for AIDS Research (CFAR)
- The Adult AIDS Clinical Trials Group (AACTG)
- The Pediatric AIDS Clinical Trials Group (PACTG)
- The California Collaborative Treatment Group (CCTG)
- The HIV Neurobehavioral Research Center (HNRC)
- The Southern California Primary Infection Program
- The HIV Costs and Services Utilization Study (HCSUS)
- The VA Quality Enhancement Research Initiative for HIV (QUERI-HIV)
- The San Diego AIDS Education and Training Center (AETC)
- The Owen Clinic, providing primary health care services
- The AntiRetroviral Research Center (AVRC)
- The UCSD Mother, Child and Adolescent Program

The institute sponsors seminars and workshops as well as offering developmental grants to new investigators in the area of human immunodeficiency virus (HIV) and acquired immune deficiency syndrome (AIDS) related research.

Together with research and development the ARI is fully committed to serve as a community resource for information and assistance regarding infection, treatment, and education in HIV and AIDS. We are here to serve as the regional resource for all aspects pertaining to HIV and AIDS and, as a leader in research and education, to cure the infected and prevent the uninfected from becoming infected.

The California Institute for Telecommunications and Information Technology (Cal-(IT)²) (http://www.calit2.net) is an organized research unit that seeks to ensure that California maintains its leadership in the telecommunications and information technology marketplace. The institute's mission is simple: Extend the reach of the Internet throughout the physical world. Cal-(IT)² is a partnership between UCSD and UC, Irvine, and is one of four institutes established in December 2000 through the California Institutes for Science and Innovation (CalISI). It is funded by a state capital grant, federal research grants, industry, and foundations.

The institute is organized conceptually into five vertically interlocking "layers." The five layers are materials and devices; networked infrastructure; interfaces and software systems; four applications areas; and policy, management, and socioeconomic evolution. The initial four applications—environment and civil infrastructure, intelligent transportation and telematics, digitally enabled genomic medicine, and new media arts—are target core concerns related to California's quality of life and represent large market segments of California's economy poised to be transformed by the new Internet. Each layer and application has a leader listed on the Cal-(IT)² Web site.

More than 220 professors and senior researchers, industrial partners, postdoctoral researchers, and graduate and undergraduate students are collaborating on interdisciplinary projects in living laboratories. These labs include collaborative frameworks that span multiple layers to enable creation of larger-scale activities to address real world problems, such as pollution, traffic congestion, and the pressing needs of medical practice. Early activities have focused around eight living labs; some are "technology-driven," some are "application-driven," and one is "culture-driven." The labs provide a context to deploy and test new technologies in various combinations and experiment with new applications.

The Institute for International, Comparative, and Area Studies (IICAS) was created in 2001 to promote research on international, comparative, and cross-regional topics. Building on the substantial existing strengths of UCSD in international studies, IICAS coordinates and supports the research of faculty in departments, area studies programs, and the Graduate School of International Relations and Pacific Studies. It is closely associated with undergraduate and graduate education in international studies, including Eleanor Roosevelt College and the international studies major, whose program offices are housed within the institute.

IICAS has three principal initial roles. First, it serves as a research catalyst, fostering and incubating interdisciplinary and cross-area research groups and projects. Activities have included the launch of a European Studies initiative, a faculty research project on globalization, territoriality, and conflict, and a multiyear, interdisciplinary research workshop examining the empire-to-nation transition. Second, IICAS coordinates and provides services for existing and new international and area studies programs in development and events planning and coordination. It also encourages new programs in international and area studies. In this role, IICAS has co-sponsored campus-wide panels and seminars that address critical international issues. Third, the IICAS director and advisory committee advise the senior vice chancellor for academic affairs on campus priorities and appointments in international studies. IICAS also provides campus wide services in support of UCSD's international contacts, including international visitors, requests for affiliation agreements, and collaborative international research projects.

The UCSD Institute of Molecular Medicine (IMM). Our mission is: *Integration of Molecules and Medicine*—to create an Olympic village for translational medicine in the San Diego biomedical community, *Innovation at Disease Interfaces*—to lead in the cross-fertilization between diverse human diseases and disciplines, *Interdisciplinary Training*—to mentor many of the highest caliber physician-scientists from the United States and abroad, and *International Programs*—to offer global outreach to Europe and Asia through innovative collaborations and partnerships. IMM is designed to provide a unique research and training atmosphere for graduate students, Ph.D. students, M.D. fellows, and M.D./Ph.D. fellows with a scientific focus on molecular medicine in the post-genome era. The Institute of Molecular Medicine was established in June 2000 as an organized research unit at UCSD, and has been designed as a Center Without Walls to encour-

age interactive, interdisciplinary, educational, and research opportunities in the growing field of molecular medicine. The faculty members of this institute are committed to creating and maintaining a collaborative environment that will ensure the rapid development of novel, biologically targeted therapies to enhance the lives of the patients of tomorrow. The first phase of programs has been established in the areas of cardiovascular and neurological diseases; however, it is anticipated that studies in other complex human diseases will be included as scientific and clinical opportunities are solidified in the new institute. A current National Institutes of Health Training Program is a joint program with collaborators at The Salk Institute, which affords students an opportunity to work for periods of time at both institutions, depending upon the technology that is being applied to their particular research project. Research and educational programs include stem cell biology, regeneration, chemical biology, neuroscience, computer modeling, and genomics.

The Institute of Molecular Medicine's goals and objectives are: 1) to expand on the growing vertebrate genomic databases and a variety of genetic based approaches to form a multidisciplinary research program to unravel complex human diseases, including heart and neurological disorders; 2) to provide a high-technology platform that will be based upon collaborative research efforts between prominent scientists in the fields of bioengineering, neuroscience, chemistry, physiology, biology, and genetics; 3) to provide an international, cross-institutional, interdisciplinary training program in the Molecular Basis of Complex Human Physiology and Diseases, for M.D., M.D./Ph.D., and Ph.D. postdoctoral fellows; 4) to develop strategic research collaborations, educational exchange programs, and training alliances with other international institutions; and 5) to promote the development of industrial collaborations for specific targeted areas of both scientific and clinical interest.

Seventy-five faculty members from UCSD, the Salk Institute for Biological Studies, The Scripps Research Institute, The Burnham Institute, and internationally based collaborators are participating in the Institute of Molecular Medicine. These participants represent a cross-section of the investigators and educators who constitute the scientific and clinical community of leading investigators working and teaching in areas related to molecular, cellular, genetic, and bioengineering approaches to identify pathways that control complex human physiological systems and related diseases. Each year the IMM hosts an international symposium, Days of Molecular Medicine, which brings world leaders to La Jolla to present state-of-the-art lectures and provides programs that allow students in the IMM to meet and discuss their projects with the speakers and senior scientists in attendance. This year, the journal *Nature Medicine* and IMM will co-sponsor the 2004 symposium "Integrative Physiology and Human Disease: Neurohormonal and Metabolic Pathways" at the Wellcome Trust Genome Center, Hinxton Campus in Cambridge, England. Further information can be found online at http://www.imm.ucsd.edu/dmm/foundation.html. The 2005 DMM conference will once again return to the Salk Institute in La Jolla. In addition to strengthening the ties in academia, the symposium also provides an opportunity for corporate sponsors to discuss potential collaborations and meet with the next generation of physician-scientists in this ever-changing field. The Institute of Molecular Medicine is based on the vision that a new era in human health and drug discovery lies at the borders between curiosity-driven science and tomorrow's medical therapies.

The Institute for Neural Computation (INC) focuses on research into how nervous systems function through experimental investigation and modeling of neural activity, and on applying knowledge of nervous system function to the design of new technologies. The institute supports graduate training programs in cognitive neuroscience and computational neurobiology.

The Swartz Center for Computational Neuroscience develops models of brain dynamics from electromagnetic and hemodynamic data acquired during novel human behavioral experiments.

The Machine Perception Laboratory studies human perception and develops similar capabilities for robots. Additional areas of research include visual coding, motor control systems, and learning algorithms. The goal is to gain insights into how the brain works by investigating the nature of the problems it faces. This includes the development of possible solutions to these problems in the form of robots that interact with humans in real time.

The goal of the Lee Laboratory is to develop new machine learning algorithms for advanced signal and image processing inspired by recent progress in understanding how the brain represents and learns sensory information.

Faculty from the Departments of Biology, Computer Science and Engineering, Cognitive Science, Economics, Philosophy, Neurosciences, and Radiology, and the Salk Institute for Biological Studies are actively involved in the institute's activities. The institute has an active visitors program and an industrial affiliates program with ongoing joint research projects. The institute sponsors a seminar series, the annual Rockwood Memorial Lecture, and several scientific workshops and conferences annually.

The Institute for Nonlinear Science (INLS) promotes interdisciplinary research and graduate education in the development and application of contemporary methods in the study of nonlinear dynamical systems. Using a common mathematical language, faculty and students from disciplines as diverse as physics, mathematics, oceanography, biology and neuroscience, mechanical and electrical engineering, and economics pursue the implications of generic characteristics of nonlinear problems for their subjects. Each year the institute sponsors several long- and short-term senior visitors from the University of California and elsewhere and provides, through funds from external funding agencies, support for approximately ten graduate students to work on Ph.D. dissertations concerned with nonlinear problems. Also associated with INLS are approximately twenty full-time research scientists and postdoctoral researchers.

The core of INLS activities is composed of (1) joint research among faculty and students across disciplinary lines and (2) lecture series and working seminars designed to convey recent research progress and to stimulate new investigations. Through contracts with external agencies the INLS supports experimental, numerical, and theoretical studies of nonlinear dynamics and chaos in neurophysiology, investigations in nonlinear fluid dynamics and pattern formation, studies (jointly with the University of California, Los Angeles and Stanford University) of applications of chaos in communications, as well as in the nonlinear dynamics of granular materials.

INLS has developed joint research programs with universities, research institutes, and commercial companies in areas of common interest. It actively works with colleagues at UCLA, Stanford, Cal Tech, Argonne National Laboratory, ST Microelectronics, Time Domain Inc., and Randle Corporation. These affiliations provide new

research horizons and realistic opportunities for technology transfer.

Institute for Pure and Applied Physical Sciences (IPAPS) is an interdisciplinary research unit which brings together faculty and researchers in physics, chemistry, engineering, and Scripps Institution of Oceanography. The institute is concerned with fluids and materials. Specific subjects of research include superconductivity, ferromagnetism, semiconductor heterostructures, solid surfaces, plasma physics, hydromagnetics, turbulence, fluid mechanics, laser physics, and numerical analysis.

Within the IPAPS is the Center for Interface and Materials Science (CIMS), which emphasizes interdisciplinary collaborative research on the properties of surfaces, thin-layered composites, and novel materials, as well as their technological applications. With centralized space and equipment, CIMS brings together faculty and research staff from the Departments of Physics, Applied Mechanics and Engineering Sciences, Chemistry and Biochemistry, Electrical and Computer Engineering, and the Scripps Institution of Oceanography.

The **Sam and Rose Stein Institute for Research on Aging (SIRA)** is an ORU committed to fostering healthy aging by supporting advances in patient care through innovative research, training, and education. Established in 1983, the unit consists of eighty-five researchers representing eleven different departments ranging from bioengineering to family and preventive medicine and from neurosciences to psychiatry. This wide diversity fosters an interdisciplinary approach to solving the problems posed by diseases that increase with age. SIRA sponsors "Faculty Start-up Grants" to junior-level scientists in order to allow them to lay a foundation of data necessary to compete for national funding and help with career development. To facilitate cooperative research endeavors, SIRA has also instituted the Faculty Collaborative Grant Program that provides funding for researchers from different medical/biological disciplines to work together in developing innovative projects.

In addition, the institute is active in recruiting young students to the field of aging through the "Student Investigator Grant Program." Undergraduate and medical students, who have expressed an interest in age-related research, are teamed with established senior scientists to pursue a research project. *Healthwise*, the monthly newsletter, informs community members of upcoming lectures and events sponsored by SIRA and UCSD, health and wellness information, and advances in medical research. Coupled with the newsletter, a monthly public lecture open to the public is presented by SIRA faculty members. These lectures are videotaped and replayed on UCSD-TV, other local stations, and also by satellite stations. These tapes are available to SIRA members, faculty, and students, and can be purchased at the UCSD Bookstore. In addition to our community outreach and education, SIRA and the Academic Geriatric Resource Center has developed a new series called "Aging in the New Millennium." These health promotion presentations provide information to seniors enabling them to make appropriate and healthy lifestyle choices. These presentations are taped and will be aired on UCSD-TV.

Lastly, SIRA provides health promotion presentations to the public and non-profit community groups through its executive director and research faculty. Contact steininstitute@ucsd.edu for information and scheduling.

All of the above information and more can be accessed on the SIRA Web site, http://SIRA.ucsd.edu.

Whitaker Institute of Biomedical Engineering (WIBE) was established as an organized research unit in 1991 and named as the Whitaker Institute in 2000. Its purpose is to promote and coordinate interdisciplinary research among faculty and students at the interfaces of engineering, biology, and medicine. The overarching theme is integrative bioengineering, spanning the spectrum from molecular to organismal levels and integrating engineering and biomedical sciences. The major research thrusts are genomic bioengineering, molecular biomechanics, tissue engineering, and systems biology. Engineering principles and techniques are combined with biomedical research across the entire biological hierarchy ranging from genomic and molecular levels, through cells and tissues, to organs-systems. The aim is to have an integrative understanding of the structure-function relationships in normal and pathological conditions and development of bioengineering approaches to restore, maintain, or improve functions. The research pursued in WIBE involves the heart, blood vessels, blood, lung, kidney, liver, pancreas, muscle, bone, cartilage, tendon, ligament, skin, nerve, brain, retina, and cochlea, as well as targeted molecular delivery based on engineering principles. WIBE research and training activities include medical subjects such as cancer, diabetes, myocardial infarction, hypertension, atherosclerosis, peripheral vascular diseases, hemolytic anemias, pulmonary diseases, renal diseases, hepatobiliary diseases, inflammation, AIDS, burns, trauma, shock, retinopathies, tympanic membrane perforation, orthopedic disorders, and sports injuries. Coordinated engineering and biomedical research allows generations of quantitative information and new investigative approaches.

The ultimate goal is improving the methods of prevention, diagnosis, and treatment of diseases. WIBE facilitates university-industry cooperation. It sponsors regular research seminars, workshops, and symposia to promote information exchange and generate new ideas and projects, and fosters interdisciplinary training of graduate students and postdoctoral fellows. WIBE has nearly 100 faculty and research scientists from the Jacobs School of Engineering, School of Medicine, Divisions of Biological Sciences and Physical Sciences, Scripps Institution of Oceanography, and members of neighboring institutions, including The Burnham Institute, the Salk Institute for Biological Studies, and The Scripps Research Institute. The institute has an industrial advisory board, which has twenty company representatives in San Diego and elsewhere, that fosters collaborative research projects, joint grant applications, co-sponsoring of symposia and workshops, student internship, and other academia-industry cooperative activities. Together with the Department of Bioengineering, WIBE received a Leadership Award from the Whitaker Foundation. Matching gifts from the Charles Lee Powell Foundation and the William J. von Liebig Foundation, as well as other donors, have made possible the construction of the new Powell-Focht Bioengineering Hall in 2002, the first privately funded building on the UCSD campus.

The **Project on Glucose Monitoring and Control** is a unit within WIBE. Its goal is to develop and evaluate new approaches, both natural and engineered, to achieve ideal blood glucose control and metabolic management in diabetes and related diseases. The project brings together researchers and clinicians from bioengineering, electrical engineering, computer science, and medicine, as well as extramural collaborators. The project serves as a nucleus for information exchange, development of new sensor and medication delivery approaches, and development and evaluation of control strategies.

Centers

The **Rebecca and John Moores UCSD Cancer Center (CC)**, active in the fight against cancer since 1979, is a National Cancer Institute-designated Comprehensive Cancer Center. The specific goals of the Cancer Center are to enhance the present level of basic research, increase collaborative research, increase the application of basic science to solve clinical problems through translational research, disseminate new knowledge to oncology professionals and scientists in the San Diego community, enable the biomedical industry to transfer new technology to the clinical setting, develop a strong effort in cancer prevention and control, and educate and train undergraduate and postgraduate physicians, and basic scientists. Under the auspices of a Cancer Center Support Grant from the National Cancer Institute, there are seven active program areas within the Cancer Center. These include Cancer Biology, Cancer Genetics, Cancer Prevention and Control, Cancer Pharmacology, Cancer Symptom Control, Translational Oncology, and Viral Malignancy. Shared resources at the Cancer Center include Biostatistics, Clinical Trials, Data Compilation and Analysis, Digital Imaging, DNA Sequencing, Flow Cytometry, Histology and Immunohistochemistry, Microarray, Molecular Pathology, Nutrition, Radiation Medicine, and Transgenic Mouse.

Research and educational grants support the training of postdoctoral fellows and medical students. The Clinical Trials Office coordinates clinical research trials involving cancer patients at UCSD and is the focal point for a large Oncology Outreach Network which provides state-of-the-art protocol treatment opportunities for patients in a broad geographic area. Patient care activities of the Cancer Center are located in the Combined Oncology Clinic at the Theodore Gildred Facility and in UCSD Medical Center, both located in Hillcrest, and at the Oncology Clinic of the Perlman Ambulatory Care Center and in UCSD Thornton Hospital, both located in La Jolla. Basic research activities of the Cancer Center are carried out at a variety of other locations on or adjacent to the La Jolla campus. Total membership of the Cancer Center exceeds 260 laboratory investigators and clinical physicians from twenty-two academic departments. The research funding for Cancer Center members exceeds $180 million. Construction is currently underway on the university's east campus to erect a five-story, 270,000-square-foot building to unite many of the center's essential programs and services; it is scheduled for completion in early 2005.

The **Center for Astrophysics and Space Sciences (CASS)** is an interdisciplinary research unit established in 1979. The center brings together academic and research staff from the Departments of Physics, Chemistry, and Electrical and Computer Engineering. Research is conducted in the scientific areas of theoretical cosmology, computational astrophysics, observational cosmology, interstellar medium, star formation; solar observational and theoretical studies; X-ray and gamma-ray astrophysics; experimental and theoretical magnetospheric and space plasma physics; and cosmochemistry, including the chemistry of interstellar matter.

CASS provides a jointly shared facility which has office, laboratory, and computer space to enhance the interchange of expertise. Researchers in CASS have access to many University of California observing facilities, including the 2 Keck 10m telescopes, Lick Observatories, and Keck Telescopes, and have contributed experiments to many major NASA space missions including *the Hubble Space Telescope and the Rossi* X-Ray Timing Explorer. Associated with CASS are included seventeen faculty, about twenty-five Ph.D.-level research staff, twelve graduate students, and thirty technical and administrative support personnel.

The center's facilities, faculty, and research staff are available to graduate students in the Departments of Physics, Electrical and Computer Engineering, and Chemistry who have chosen to write their dissertation on subjects of research encompassed by CASS. Graduate and undergraduate courses in astrophysics, astronomy, and space sciences are developed and taught by the academic staff of CASS. The total yearly budget is about $5 million, mostly from federal funding sources.

The Center for Comparative Immigration Studies (CCIS) is an interdisciplinary, multinational research and training program devoted to comparative work on international migration and refugee movements. Its primary missions are to conduct comparative (especially cross-national) and policy-oriented research, train academic researchers, students, and practitioners, and disseminate research conducted under its auspices to academics, policymakers, and NGOs through research seminars, conferences, publications, the Internet, and the mass media. The center is also committed to actively collaborating with other academic institutions, governmental and nongovernmental organizations, and the local community.

The overall objective of the **Center for Energy Research (CER)** is to provide an academic research unit for interdisciplinary interactions among UCSD faculty, research staff, and students aimed at promoting and coordinating energy research and education. Approximately sixty-one faculty, staff, and students are affiliated with the CER. The goals of the CER are complementary to academic departments of instruction and research with an emphasis on bridging the various disciplines related to energy research on the campus. Emphasis is currently on combustion and fusion energy research. The CER will also provide a vehicle for developing other dimensions of energy research, including energy policy research. The specific goals of the CER are: (1) to provide an inter-departmental coordinating function for energy research groups and projects at UCSD, (2) to enhance the prospects of extramural research funding involving interdepartmental and multi-disciplinary collaborations in energy research, (3) to promote the visibility *of energy topics in undergraduate and graduate* programs at UCSD, (4) to provide a mechanism for interacting with other institutions involved in energy research with particular attention to potential industrial partners, and (5) to promote the visibility of energy research at UCSD to potential sponsors and funding agencies.

A number of graduate research assistantships are available. Applications for graduate study in any of the disciplines covered by the CER should be directed to the academic department in which graduate study is to be undertaken.

The **Center for Environmental Research and Training (CERT)** coordinates the broad range of environmental research activities across the university. Departmental participation includes the Departments of Anthropology, Chemistry and Biochemistry, Economics, Division of Biological Sciences, School of Engineering, School of Medicine, Scripps Institution of Oceanography, the Center for U.S.-Mexican Studies, and the Graduate School of International Relations and Pacific Studies. This extensive group offers an opportunity to address environmental issues across traditional disciplinary boundaries. This opportunity is particularly crucial for understanding the complex interactive nature of global and regional environmental issues. The CERT also provides an interface for interaction

with environmental agencies outside the university, including the environmental technology sector and governmental agencies.

The **Center for Human Development (CHD)** is an interdisciplinary, research-centered unit designed to meet the growing needs for interdisciplinary exchange on issues related to human development. The goal of CHD is to provide a forum for interdisciplinary exchange that creates dialogue between members of diverse disciplines. The Center is organized around five structurally distinct components, but with integrated functions. Each function is designed to serve a specific set of needs and to make unique contributions to the larger enterprise. These components are the following: (1) research support and infrastructure, (2) enrichment of human development's instructional counterparts–the undergraduate Human Development Program and a proposed interdisciplinary graduate program, (3) dissemination activities focused on but not limited to local community needs, (4) public policy analysis, and (5) assessment activities. In addition, the Center serves as a focal point for research, evaluation, and assessment activities associated with the campuswide Center for Research in Educational Equity, Assessment, and Teaching Excellence (CREATE).

The **Center for Human Information Processing (CHIP)** is a research facility for the study of the neural and cognitive mechanisms underlying human perception, thought, and emotion.

CHIP has two missions—a practical one and a theoretical one. The practical goal is to help develop new therapeutic approaches for the treatment of neurological and psychiatric patients (e.g., stroke and childhood autism). The theoretical agenda is to understand the neural basis of human behavior—the question of how the activities of millions of tiny wisps of protoplasm in the brain gives rise to all the richness of our conscious experience and the complexity of our cognitive processes.

It is ironic that even though we now have a vast amount of factual information about the brain, even the most basic questions about the human mind remain unanswered. How does the human brain create and respond to art? Why do we enjoy music? How are metaphors represented in the brain? What is "body image" and why does it get distorted in Anorexia nervosa? How did language evolve? Or even more basic questions such as: How do we see color? Can we pay attention to only one thing at a time? How do we recognize faces so effortlessly?

CHIP has become well known for tackling questions such as these experimentally. CHIP has played a major role in the emergence of such new disciplines as "neuro-ethics," "neurotheology," "neuroeconomics," "neuro-aesthetics," and "neuro-epistemology."

CHIP has four divisions, each operating with the common goal of furthering our understanding of human cognitive processes and the neurological bases of these processes. The subdivisions are: brain and perception division, the cognitive processes division, the division of neuropharmacology and alternative medicine, and the language processing division.

CHIP provides facilities for visiting scholars and supports workshops, conferences, and brown-bag discussion groups centering on the theoretical and empirical issues in each of these areas.

The **Laboratory of Comparative Human Cognition**: Each member of LCHC pursues forms of critical empirical research, which aim to understand the historical construction of human life. We use a range of methodological tools to throw into relief the contingency of culturally inflected collective social practices, change over time, and the implications of social practices for human development. And, in keeping with the critical ethos of our orientation, we often utilize strategies to actively initiate change in the settings we investigate. We take an ecological approach, looking at systems that include meditating tools, people, representations, institutions, and activities. We are especially interested in the collective accomplishment of knowledge practices—cognition, learning, remembering (and forgetting), teaching, research, and engineering. Collectively, our research spans all ages. At the same time, because the institutionalization of social practices holds an important place in our studies, specific projects often take the form of "educational" or "workplace" research. In both "domains," the place of discourses, economics, and technologies in the development of social relations of power, and their implications for change over time, are scrutinized. We find comparisons across these realms a powerful source of insight and theoretical development.

The LCHC published fifteen volumes of *The Quarterly Newsletter of the Laboratory of Comparative Human Cognition*. It now publishes a journal, *Mind, Culture, and Activity: An International Journal*. The LCHC also coordinates an international electronic discussion (http://communication.ucsd.edu/MCA/Mail/index.html) that currently includes more than 400 researchers from sixteen countries. The LCHC conducts a weekly seminar and workshops focused on special topics, including cutting-edge research reports from members of an interdisciplinary, international group of LCHC alumni who visit periodically.

The **Center for Iberian and Latin American Studies (CILAS)** coordinates and promotes Latin American and Iberian research and service activities for faculty and students in all departments at the university and outreach programs for the San Diego community. It sponsors multi-disciplinary colloquia, conferences, projects and publications, collaborations and exchanges with Latin American institutions, as well as library expansion. The center is currently launching new initiatives in the areas of public health; democracy, civil society, and citizenship; and cultural studies. The center also hosts visiting scholars, and it awards grants and fellowships each year to promising graduate students.

The Center for Magnetic Recording Research (CMRR) is devoted to multidisciplinary research and education in areas of science and engineering that form the foundation for information storage technologies for computer disk and tape drives. Founded in 1983 in partnership with a consortium of industrial sponsors, the center's continuing mission is to advance the state-of-the-art in magnetic disk and tape storage technologies, while producing highly trained graduate students and postdoctoral professionals. Together, the center's faculty and graduates have made major contributions to the remarkable progress that storage systems have achieved in storage capacity, data transfer rate, and cost efficiency over the past two decades.

CMRR supports four endowed professorial chairs, currently in the areas of magnetic materials, recording physics, tribology and mechanics of the head/medium interface, and signal processing and coding. The chaired professors also hold faculty appointments in the Departments of Physics, Electrical and Computer Engineering, and Mechanical and Aerospace Engineering. Graduate student researchers, post-graduate researchers, professional scientists, and visiting scholars representing international academic institutions and industrial laboratories contribute to a research and educational environment that is dynamic and varied.

As part of the center's mission to educate future leaders in the vital information storage industry, the faculty teach specialized classes at the undergraduate and graduate levels that train students in the theoretical methods and experimental techniques underlying advanced magnetic recording technology. In addition, the center contributes to the continuing education of professionals in the storage industry through regular seminars, research reviews, and focused workshops.

Virtually all major information storage companies are sponsors of CMRR, and they provide substantial research support through their membership fees, focused research grants, and graduate student fellowships. "Real-world" research opportunities are also available to students through academic-year and summer internships with selected sponsors. Additional support has come from private foundations, state, and federal funding agencies, as well as from active participation in joint university-industry programs, such as those coordinated by the Information Storage Industry Consortium (INSIC).

Through cooperative research projects and the CMRR affiliated faculty program, the center also fosters interactions with researchers in other campus organizations, including the Department of Chemistry and Biochemistry, the Department of Computer Science and Engineering, the San Diego Supercomputer Center, and the Information Storage Industry Center in the Graduate School of International Relations and Pacific Studies. The interests of these affiliates cover a broad spectrum, including novel materials for data recording, disk-drive failure prediction, computational analysis of the recording process, and the globalization of the magnetic recording industry.

CMRR also supports a world-class Library/Information Center for information storage technology that provides a range of services to sponsors, resident researchers, and students. Services include licensed database searching, patent searching, document retrieval, and expedited access to proprietary technical resources.

The **Center for Molecular Agriculture (CMA)** promotes research and education in plant genetics and plant molecular biology with an eye to the application of that research to the improvement of crops. Crop improvement cannot any longer rely exclusively on traditional plant breeding methods but requires the application of new technologies that include but are not limited to genetics and genomics, informatics, molecular gene isolation, and plant transformation. The CMA brings together researchers from UCSD and the Salk Institute and is a resource for the entire San Diego community. It provides a focal point for interaction with the local and statewide agricultural biotechnology industry. The Center wishes to play an active role in the debate about the safe cultivation and use of genetically modified crops.

The **Center for Molecular Genetics (CMG)** promotes molecular genetic research and the training of graduate students and postdoctoral fellows in the biological, chemical, and biomedical sciences. The center's research incorporates studies in both model systems and humans that share a focus on dissecting the molecular basis of human diseases. The latest techniques of gene isolation and manipulation, as well as the genetic transformation of both cells and organisms, are applied to major problems in biology and medicine. The center serves as a resource for the entire UCSD campus for molecular genetic techniques, materials, and facilities. The CMG also is host to seminar series, conferences, and workshops that encourage cross-disciplinary interactions among biomedical and bioinformatic investigators.

The Center for Research in Biological Systems (CRBS) is an organized research unit that exists to provide human resources, high-technology equipment, and administrative services to researchers engaged in fundamental research on cell structure and function relationships, particularly those involved in central nervous system processes, cardiovascular networking, and muscular contraction. CRBS scientists investigate these processes through invention, refinement, deployment of sophisticated technologies, especially

- High-powered electron microscopes that reveal three-dimensional cell structures
- State-of-the-art X-ray crystallography and magnetic resonance analysis that provide detail on protein structures at high resolution
- Laser-scanning and Confocal light microscopes that reveal molecules tagged with fluorescent markers as they traffic within cells and pass transfer signals within and between cells
- High performance computing and grid-based integration of distributed data

CRBS facilitates an interdisciplinary infrastructure in which people from biology, medicine, chemistry, and physics can work with those from computer science and information technologies in collaborative research. CRBS researchers share interests in the study of complex biological systems at many scales, from the structures of enzymes, proteins, and the body's chemical communications network at atomic and molecular levels, to an organism's physiology, strength, and support at cellular and tissue levels.

The CRBS infrastructure integrates resources for high-performance computing, visualization and database technologies, and the grid-integration of large amounts of archival storage data. The California Institute for Telecommunications and Information Technology (Cal-IT^2) and the San Diego Supercomputer Center (SDSC) are collaborators in simulating the activity of biological systems, analyzing the results, and organizing the growing storehouse of biological information.

The aims of CRBS researchers are met in interdisciplinary research efforts of major federally funded research efforts that are presently the heart of CRBS:

- BIRN, the Biomedical Informatics Research Network http://www.nbirn.net tests new modes of large-scale biomedical science. BIRN builds infrastructure and technologies to enable large-scale biomedical data mining and refinement.
- NCMIR, the National Center for Microscopy Imaging Research http://www.ncmir.ucsd.edu specializes in the development of technologies for improving the understanding of biological structure and function relationships spanning the dimensional range from 5nm3 to 50μm3.
- NBCR, the National Biomedical Computation Resource http://nbcr.ucsd.edu conducts, catalyzes, and advances biomedical research by harnessing, developing, and deploying forefront computational, information, and grid technologies.
- JCSG, the Joint Center for Structural Genomics http://www.jcsg.org creates new technologies to drive high-throughput structure determination. The Bioinformatics Core at UCSD is responsible for target selection, sample tracking, information management, structure validation and deposition, and poststructural analysis. Through these functions, the group provides the integrated informatics backbone required for the successful operation of JCSG.

CRBS researchers also have significant roles in collaborations with

- PRAGMA, Pacific Rim Applications and Grid Middleware Assembly, http://www.pragma-grid.net establishes sustained collaborations and advances the use of grid technologies in applications throughout the Pacific Region to allow data, computing, and other resource sharing.
- Optiputer, http://www.optiputer.net, involves the design and development of an infrastructure to integrate computational, storage and visualization resources over parallel optical networks using lambda switching communication mechanisms.

CRBS is an entity evolving as research evolves. It was established in 1996 to involve researchers from disciplines across UCSD, the School of Medicine, the Salk Institute for Biological Studies, Cal-IT², and SDSC, including bioengineering, biology, chemistry, computer science, mathematics, neurosciences, pharmacology, psychiatry, and physics, and forges interactions with biotechnology and biocomputing companies for technology transfer. Interaction, collaboration, and multiscale research produce new perspectives, reveal fruitful research topics, lead to the development of new technologies and drugs, and train a new generation of researchers in biological systems.

The Center for Research in Computing and the Arts (CRCA) is an organized research unit of UCSD whose mission is to facilitate the creation of new forms of art that arise out of the developments of digital technologies. Current focus areas include networked multimedia, virtual reality, computer-spatialized audio, and live performance techniques for computer music and graphics.

As the University of California's oldest arts research center, CRCA pursues innovative approaches to the arts, crossing disciplinary boundaries with the humanities, engineering, and the sciences. Faculty members devise new modes of artistic practice through their liaisons with international cultural institutions, high-tech industries, and interdisciplinary collaborations.

CRCA coordinates the New Media Arts layer of the California Institute for Telecommunications and Information Technologies [Cal-(IT)²] at UCSD. The center's cultural research activities are considered a model "living laboratory" for Cal-(IT)² provocatively, and critically, pursuing new cultural forms and social engagements provided by developments in IT and telecommunications.

CRCA provides the support framework for a broad range of approaches to artistic, scholarly, and technological development that is at the basis of our digitally transformed culture. We actively encourage the investigation of what constitutes the potent cultural acts of our time and the viable mechanisms that should be engaged to create them. More information about the center, its researchers, public events, and the process for engagement, can be found at http://crca.ucsd.edu.

Center for Research in Language (CRL). The foci of the center are on language processing, language learning, language disorders, and simulations of all these aspects of language in artificial systems. Research in the center is interdisciplinary and draws upon the fields of linguistics, psychology, cognitive science, neurosciences, computer science, and communication.

The center's facilities are designed to accommodate laboratory research projects by the faculty and graduate students; facilities include a number of high-performance work stations, a computer laboratory, extensive equipment for audio recording and analysis, and equipment for psycholinguistic experimentation.

Current research projects include studies of language and cognitive development in children; language impairment in children and adults; word and sentence processing in bilinguals; foreign vocabulary in American Sign Language; development of neurally inspired parallel processing models of speech perception; studies in first language acquisition; cross-linguistic comparisons of the process of language acquisition and aphasia; research on the integration of grammatical analyses and theories; a project to collect large-scale text corpora in electronic form; and a study of expectancy generation in sentence processing. The center administers an NIH pre- and postdoctoral training grant, "Language, Communication and the Brain." CRL has also entered into several institutional agreements with research institutions in Europe, Asia, and the Americas, providing for the exchange of personnel and support for projects of mutual interest. An ongoing speaker series presents a broad range of experimental approaches to the study of language. The center publishes a monthly electronic newsletter.

The Project in Cognitive and Neural Development is an activity of CRL. Its purpose is to provide a forum for interdisciplinary research on brain and cognition in human children, including research on the neural bases of language and communication. The project brings together faculty and research staff from the UCSD Departments of Cognitive Science, Communication, Linguistics, Neurosciences, Psychology, Psychiatry and Sociology, the San Diego State University Departments of Psychology and Communication Disorders, and the Salk Institute for Biological Studies.

The **Center for U.S.-Mexican Studies (CUSMS),** established in 1979, is the nation's largest program devoted to the study of Mexico and U.S.-Mexican relations. It supports research in the social sciences and history, graduate student training, publications, and public education activities that address the full range of problems affecting economic and political relations between Mexico and the United States.

Through its visiting researchers program, the center each year sponsors the research of predoctoral and postdoctoral scholars, who spend three to nine months in residence. Typically, people from Mexico receive over half of these awards, which are made through an open, international competition. Other visiting fellows come from Europe, Canada, East Asia, and the rest of Latin America. The center's permanent academic staff also conducts long-term studies of Mexico's competitiveness in the global economy, Mexican financial markets, the impact of remittances on development, political change and the administration of justice in Mexico, environmental problems in Mexico and the U.S.-Mexico borderlands, Mexican immigration to the U.S., and new forms of North American economic integration. The center publishes much of the research conducted under its auspices.

Each summer, the center conducts a seminar in studies of the United States for twenty-three to twenty-five Latin American social scientists and nonacademic professionals.

The center's interdisciplinary Research Seminar on Mexico and U.S.-Mexican Relations, which meets throughout the academic year, features presentations of recent research by scholars from throughout the United States, Mexico, and other countries. In addition, several research workshops on specialized subjects are held each year.

The center has an active public education program, which includes frequent briefings for journalists, public officials, and community groups.

The **Glycobiology Research and Training Center (GRTC)** seeks to facilitate and enhance

glycobiology research and training at UCSD. Current faculty membership includes many UCSD faculty from several departments across the School of Medicine, SIO, and the general campus as well as adjunct faculty at nearby institutions. Affiliate members include interested scientists in the La Jolla area as well as faculty from other UC campuses.

Glycobiology is the study of the structure, biosynthesis, and biology of sugar chains (called oligosaccharides or glycans) that are widely distributed in nature. All cells and many proteins in nature carry a dense and complex array of covalently attached glycans. These are often found on cellular and secreted macromolecules, in an optimal position to modulate or mediate events in cell-cell and cell-matrix interactions that are crucial to the development and function of a complex multicellular organisms. They can also mediate interactions between organisms (e.g., between host and parasite). In addition, simple, rapidly turning-over protein-bound glycans are abundant in the nucleus and cytoplasm, where they appear to serve as regulatory switches. The development of a variety of new technologies for exploring the structures of these glycans has recently opened up this new frontier of molecular biology.

The GRTC seeks to foster interactive research in glycobiology by coordinating the availability of state-of-the-art instrumentation and expertise in the structural analysis of glycans through a Glycotechnology Core Resource, increasing intellectual and collaborative interactions by organizing symposia, joint programs and seminars, coordinating joint applications for extramural support, improving access to relevant informatics, and facilitating the transfer of basic glycobiology research to practical applications. The Center also strongly emphasizes graduate, postgraduate, and medical student education in glycobiology, including contributions by the faculty to core curricula, as well as to elective courses and journal clubs.

The San Diego Supercomputer Center (SDSC) is an organized research unit of UCSD that provides world leadership in developing and applying technology to advance science. SDSC research activities are undertaken jointly with faculty from UCSD departments, including computer science and engineering, bioengineering, biochemistry and chemistry, pharmacology, physics, and Scripps Institution of Oceanography; local research institutions such as The Scripps Research Institute and the Salk Institute for Biological Studies; and national and international collaborators.

With a staff of 400 scientists, software developers, and research, operations, and user support staff, SDSC is focused on data management, high-end computing, integrative biosciences, geoscience, grid and cluster computing, and visualizations.

SDSC's data management activities provide data integration for large-scale application efforts within UCSD and beyond in fields such as geosciences, biological and environmental sciences. Two key projects include the Geoscience Network (GEON) and the Sceince Environment for Ecological Knowledge (SEEK). GEON weaves together separate informational strands into a unified fabric that enables the discovery of data relationships within and across Earth science disciplines.

SEEK uses SDSC's computational science resources to provide the computational and data-management components of UCSD's strong environmental informatics program. Reflecting the dramatic increase in humankind's ability to change the environment, the study of environmental informatics is increasingly critical to California. SDSC and UCSD are building and supporting a program that spans scales from the molecular level to entire populations, accurately modeling the impact of population on the environment.

In addition, SDSC pursues data management activities such as digital library initiatives, data-system standardization, and opportunities to impact large-scale data mining, analysis, and knowledge synthesis with academic, federal, and commercial partners. SDSC's high-end computing unit is leading a national effort to understand and deploy the most capable computational environments and to make those environments easily accessible and usable by scientific communities—locally, nationally, and globally. SDSC maintains leadership in critical strategic capabilities, including chemistry, parallel applications and performance modeling, scientific visualization, and increasing collaborations with the social sciences.

Researchers involved in SDSC's integrative biosciences area are developing projects to understand how cellular behavior emerges from the molecular level, how tissue behavior emerges from the cellular level, and so on up to the level of the organism. SDSC is collaborating in this area with the UCSD School of Medicine, the Center for Research in Biological Structure, The Scripps Research Institute, the Salk Institute for Biological Studies, and local biotech and pharmaceutical companies. SDSC also is focusing on large-scale collaborative bioscience projects worldwide using an infrastructure based on high-performance computation and analysis of massive amounts of data.

As the leading-edge site of the National Partnership for Advanced Computational Infrastructure, SDSC is collaborating with forty-one partner institutions. The partnership is developing a ubiquitous, continuous, and pervasive computational environment for tomorrow's scientific discovery. Major academic researchers around the country use the powerful computing resources at SDSC to make breakthroughs in diverse areas of science—from astronomy and biology to chemistry and particle physics.

In early 2004, SDSC deployed DataStar, a 10.4 teraflops (trillion floating point operations per second) supercomputer with a total shared memory of 3.2 terabytes. DataStar is among the top supercomputers in the world. DataStar is used by researchers in academia and industry to conduct large-scale scientific research applications that involve extremely large data sets or have stressful input/output requirements.

SDSC and four partners are developing the TeraGrid—the first large-scale and production grid that provides a national computational infrastructure for open scientific research. SDSC's partners are the National Center for Supercomputing Applications at the University of Illinois, Argonne National Laboratory, the Center for Advanced Computing Research at the California Institute of Technology, and the Pittsburgh Supercomputing Center. The TeraGrid integrates more than 20 teraflops of computing power distributed at the five sites through a cross-country network backbone that operates at 40 gigabits per second. The storage facilities at SDSC alone include more than 500 terabytes of high-speed disk and six petabytes of archival storage. The complete TeraGrid project also includes facilities for high-resolution visualization environments, as well as toolkits for grid computing.

SDSC hosts huge digital collections, including astronomical images from the 2-Micron All Sky Survey, images from the Art Museum Image Consortium, Chinese text from the Pacific Rim Digital Library Alliance, and tomographic images of the human brain. The technology is also being used to prototype persistent digital archives for

the National Archives and Records Administration and other government agencies with huge data archives.

The Cooperative Association for Internet Data Analysis (CAIDA) at SDSC engages Internet providers, vendors, and users in engineering and technical collaborations to promote a more robust, scalable Internet infrastructure. CAIDA works with the community to develop and transfer tools and technologies that provide engineering and other insights relating to the operation and evolution of the Internet infrastructure. CAIDA works with providers and researchers to refine Internet traffic metrics, foster shared research environments, and encourage the development and testing of advanced networking technologies.

SDSC's Applied Network Research group is currently conducting two Internet research projects. The first involves the National Laboratory for Applied Network Research (NLANR), an NSF-supported collaboration to provide technical, engineering, and traffic analysis support for NSF's High Performance Connections sites and the nation's high-performance network infrastructure. NLANR members include SDSC, the National Center for Supercomputing Applications at the University of Illinois, the Pittsburgh Supercomputing Center, and the National Center for Atmospheric Research.

The second activity of the Applied Network Research group is the High Performance Wireless Research and Education Network (HPWREN), a collaboration with SIO that created a noncommercial, prototype, high-performance, wide-area wireless network in San Diego County. The NSF-funded network includes backbone nodes on the UCSD campus and a number of "hard to reach" areas in the county. HPWREN is demonstrating, and evaluating uses of the prototype for network analysis research, for high-speed Internet access for scientists involved in field research projects involving geophysics, astronomy, and ecology, and for educational opportunities for rural Native American learning centers and schools.

The SDSC Fellows Program promotes computational science and engineering activities at UCSD and seeks to strengthen intellectual ties between SDSC staff and other researchers on campus. UCSD faculty members are invited to join this program by contacting Kim Baldridge, kimb@sdsc.edu, (858) 534-5149.

Research Experiences for Undergraduates (REU), funded by NSF, provides an opportunity for undergraduates to work on computational science research projects under the guidance of SDSC mentors and their campus advisers. Students can participate in a full-time summer program or part-time during the academic year. Candidates must apply to and be accepted by the program. Stipends are provided. For more information, contact Rozeanne Steckler, steckler@sdsc.edu, (858) 534-5122.

Projects

The goal of the **African and African-American Studies Research Project (AAASRP)** is to facilitate faculty, postgraduate, and graduate research in the areas of Africa and African diaspora studies in the social sciences and the humanities, and to foster the comparative, cross-national, and interdisciplinary dimensions of research, with a core group of scholars drawn from several fields in the social sciences and humanities. These research efforts are linked directly to larger local and international community concerns.

The project sponsors visiting scholars, focused research groups, a seminar, and symposia. Faculty from seven university departments are involved. The project oversees the African Studies Minor. The project is also part of the UC Systemwide Consortium of African Studies Programs and the national Association of African Studies Programs. It provides the basis for the establishment of an organized research unit on African and African-American Studies at a later time. For more information, contact the AAASRP office at (858) 822-0265.

The **Project for Explaining the Origin of Humans** is a broad-based multidisciplinary coalition of individuals in the La Jolla area (from UCSD as well as surrounding institutions) who are interested in defining and explaining the evolutionary origins of humans and in generating testable hypotheses and new agendas for research regarding this matter. Areas of current interest include primate genetics and evolution, paleoanthropology and hominid origins, mammalian and primate neurosciences, primate biology and medicine, the roles of nature and nurture in language and cognition, human and primate society and culture, comparative primate reproductive biology, geographic, environmental and climatic factors in hominid evolution, as well as general theories for explaining humans. The group includes faculty from the Departments of Anthropology, Biology, Chemistry and Biochemistry, Cognitive Science, Linguistics, Medicine, Neurosciences, Oceanography, Pathology, and Psychology. A listing of participants can be found at http://origins. ucsd.edu.

The **Project in Display Phosphor Research** provides a forum for research on the synthesis, characterization, and processing of phosphors for high definition display applications. The project brings together faculty and researchers from the UCSD Departments of Chemistry and Biochemistry, Mechanical and Aerospace Engineering (MAE), and Electrical and Computer Engineering (ECE). The project was organized in 1992 in order to expand collaboration with other colleagues at UCSD and to extend research efforts to address both near-term and future research issues concerning phosphor materials and advanced displays.

The **Project In Econometric Analysis (PEA)** is concerned with the analysis of economic and financial data and with techniques for modeling relationships between economic variables and testing economic theories. As economic variables have properties not generally found in other fields, standard procedures from mainstream statistics are often not appropriate. The field of econometrics has been developed to deal with these issues. Its importance is indicated by its effect on the methodologies in other social sciences, such as political science and empirical history, and the fact that several Nobel Prize winners in economics have been econometricians. In fact, the 2003 Nobel Prize in economics was awarded to Clive Granger and Robert Engle, two of the founders of the PEA.

The Project in Econometric Analysis (PEA) supports the work of an active group of researchers and provides opportunities for productive interaction among faculty and students. Areas of active research include financial econometrics, non-linear time series modeling, properties of neural network models, the theory of economic forecasting and various actual applications including evaluations of models and forecasts in finance and economics. The PEA allows links with workers from other universities in this and other countries. In 2000–2001 and 2001–2002 the project had visitors from Europe, Asia, North America, and Australia; some were senior and some were pre- and post-doctoral students.

Faculty members and graduate students associated with the project presented their research at workshops and conferences worldwide. In addition, PEA facilitates the submission of grant proposals to outside agencies.

The **Project in Geometry and Physics (PGP),** established in 1987, provides opportunities for increased collaboration between mathematicians and physicists. The project hosts several scientific meetings each year and also sponsors a number of research seminars with distinguished scientists from inside and outside the UCSD community.

The **Project on International Affairs (PIA)** is one of the international programs within the Institute on International, Comparative, and Area Studies, focusing on economic and political interactions between states. The project serves to promote interdisciplinary research on international politics and international economics; disseminate current research to UCSD faculty and students; provide a multidisciplinary focal point for research and programming; and enhance campus and community understanding of international political and economic affairs.

The **Project on Responsible Conduct of Research Education (RCR Education Project)** was created in 2003 to promote RCR education both at UCSD and nationally. To achieve this goal, the RCR Education Project is facilitating the formation of an independent Responsible Conduct of Research Education Consortium (RCREC). The RCREC will provide leadership to the research community in promoting education in the responsible conduct of research.

The RCR Education Project and the RCREC are intended to be a broad-based coalition, representing medical, social, and behavioral research, and public and private institutions. Through these collaborations, the RCR Education Project will lay the foundations for the RCREC to advance programs of RCR education, develop RCR education standards, certify or identify programs that meet those standards, facilitate the exchange of RCR education programs among research institutions, and develop outcome measures to evaluate the success of the endeavor. Specific objectives of the RCREC are to: 1) promote RCR education as a central responsibility for any institution involved in research; 2) develop clear definitions for RCR education, including goals, standards, competencies, and methods for evaluating the effectiveness of programs; 3) assist institutions, RCR programs, and investigators in identifying and developing RCR education curricula and resources; 4) facilitate discussion and collaboration among federal agencies, public and private research institutions and organizations, professional societies, and businesses in developing, coordinating, and sharing new and existing RCR educational programs within the research community; and (5) identify and overcome barriers to fulfilling RCR educational needs and requirements.

The **Public Policy Research Project** was established to facilitate interdisciplinary research and educational opportunities in public policy and business-government interaction. Through conferences, focused research groups, and lecture series, the project acts as a catalyst for interaction among economists, political scientists, moral philosophers, historians, cognitive scientists, anthropologists, and sociologists. The project supports programs that: (1) help faculty obtain funding that are engaged in policy-related research, (2) conduct research apprenticeships for doctoral students working on research projects dealing with issues and processes of public policy, and (3) provide technical support and arrange faculty-proposed conferences within the scope of the project's mission statement.

Natural Reserve System (NRS)

The **Natural Reserve System (NRS)** was founded to establish and maintain significant examples of California's diverse ecosystems and terrain. These reserves are used for teaching and research in all disciplines, from geology and environmental sciences to anthropology and art. Faculty and students of the University of California and other institutions are encouraged to use any of the thirty-four reserves in the system for serious academic pursuits. The San Diego campus administers the following four reserves:

Dawson Los Monos Canyon Reserve: This 218-acre reserve is located in the cities of Carlsbad and Vista in north coastal San Diego County. Its young, stream-cut valley contains a year-round creek with precipitous north- and south-facing slopes. The major habitat types are Southern Riparian Woodland, Diegan Coastal Sage Scrub, Perennial Coastal Stream, Coast Live Oak Woodland, Mixed Grassland of native bunchgrass and introduced annuals, and South Coastal Mixed Chaparral. This area is also of unique and significant historical and archaeological value. A small field station provides opportunities for small laboratory classes, overnight stays, and on-site research.

Elliott Chaparral Reserve: Located ten miles to the east of campus, this 107-acre reserve, adjacent to the large expanse of Marine Corps Air Station Miramar that is undeveloped, features Chamise Chaparral typical of the Southern California coastal plain and a large stand of mature planted eucalyptus. It is readily available during a normal three-hour lab period or for term paper-length field studies as well as for more lengthy projects.

Kendall-Frost Mission Bay Marsh Reserve: This sixteen-acre reserve, together with the city of San Diego's contiguous Northern Wildlife Preserve, constitute the last remaining forty acres of tidal salt marsh on Mission Bay and one of the few such wetlands remaining in Southern California. It is recognized for the habitat it provides for several rare and endangered birds including the light-footed clapper rail, Belding's savannah sparrow, and the California least tern, as well as many resident and migratory shorebirds and waterfowl, and several fish species. An on-site trailer houses limited residential and laboratory facilities, and extensive facilities exist within ten miles on the UCSD main campus and at the Scripps Institution of Oceanography. There are opportunities for studying restoration ecology of upland and tidal habitats.

Scripps Coastal Reserve: This reserve consists of disjunct shoreline and cliff-top (or "knoll") portions. The shoreline part consists of the 67 acre San Diego Marine Life Refuge extending seaward 1,000 feet from the high tide line, and surrounding the Scripps Institution of Oceanography (SIO) Pier. Habitats include sandy beach and submerged plain, to 60 feet below mean lower low water, seasonally exposed cobble beach, rocky reef, pier pilings, and upper submarine canyon ledges. Habitats of the clifftop knoll and canyons include coastal sage scrub, maritime succulent scrub, southern coastal mixed chaparral, and disturbed grassland. The latter is particularly suitable for ecological restoration experiments. This reserve is enhanced by the availability of the laboratories and facilities of adjacent SIO and the main San Diego campus.

Campuswide Research Facilities

Academic Computing Services

See page 87.

San Diego Supercomputer Center

See page 90.

The UCSD Libraries

See page 94.

Rady School of Management

Robert S. Sullivan, Ph.D., *Dean*

UCSD's School of Management was established in 2001 and was named Rady School of Management in January 2004. It will open its doors to executive M.B.A. students in fall 2004, and to full-time M.B.A. students in fall 2005. It will pioneer the education of tomorrow's business leaders through an innovative curriculum led by internationally recognized faculty. Seeking to rapidly obtain top-tier status in its first five years, the school will leverage UCSD's strengths as a preeminent research institution, especially its outstanding programs in science, engineering, medicine, economics, and international relations. Unlike conventional M.B.A. programs, UCSD's program will target students from diverse cultural backgrounds who, although early in their careers, have an understanding and appreciation of science and technology. At steady state, targeted for 2011–12, the school will enroll 600 full-time students, 510 part-time students, and 50 Ph.D. students.

Currently located at University Center on the UCSD campus in La Jolla, the Rady School of Management facility is under design and will be located north of Eleanor Roosevelt College. Occupancy is expected to be in fall 2006.

Degree Programs

The school offers the FlexMBA, an M.B.A. degree program specifically designed for working professionals. A full-time M.B.A. program will be added in 2005. The FlexMBA is designed to meet the educational needs of working professionals in science- or technology-driven organizations who have gained or anticipate gaining managerial or leadership roles in their organizations. It provides a thorough grounding in the fundamentals of business and management in a global environment and builds on this with a distinctive curriculum focused on the implications of management principles and business realities for organizations driven by science, technology, and innovation. The FlexMBA program enables students to develop:

- knowledge of business fundamentals and their application to real-world situations
- analytical skills for evaluating information and making rigorous decisions
- an understanding of organizations and of the skills essential to collaborating with and managing people effectively
- an integrated understanding of the complex global, technological, and governmental environments in which organizations operate
- advanced abilities to assess the implications of cutting-edge scientific and technological developments for business and to move ideas from development to the marketplace
- effectiveness in communication, collaboration and teamwork, and leadership
- a commitment to ethical behavior and to integrity in business practice

For further information about courses and curriculum, program of study, and admissions requirements, refer to the Rady School of Management Web site at http://management.ucsd.edu/.

The school also offers non-degree executive education for executives and working professionals. Information on executive education course offerings is available at the school's Web site.

The School of Medicine

The faculty of the School of Medicine is committed to nurturing and reinforcing the attributes that are important in the making of a doctor–dedication, compassion, and intellectual curiosity.

The goal of the medical school curriculum, clinical experience, and faculty-student interactions is to develop well-trained, objective, and conscientious physicians prepared for the changing conditions of medical practice and continuing self-education. Students acquire understanding of the basic medical sciences and clinical disciplines and are encouraged to choose their own areas of interest for eventual development into careers in the broadly diversified medical community. Required course offerings are designed to provide students with a broad background suitable for general practice, and all students are trained in the delivery of primary care.

The School of Medicine accepted its charter class in 1968. The founding faculty drew upon the strength of UCSD's existing basic science departments rather than recreating such departments for the new school. Today this unique relationship continues with faculty from campus departments joining faculty from the School of Medicine's fourteen departments in teaching the core courses in medicine. Both preclinical and clinical courses are taught by UCSD faculty physicians who also have active patient caseloads. Courses are continually evaluated and updated by interdisciplinary course committees.

An honors, pass, fail grading system puts the emphasis on mastering the knowledge students need to practice medicine. The honors grade is not used in the first quarter of year one (only) to allow students to make a smooth transition to medical school. The honors grade is not used to rank the class numerically but to acknowledge students who have demonstrated superior academic performance. Students receive individual evaluations written by the faculty.

Students at the UCSD School of Medicine are encouraged to explore a variety of clinical, laboratory, and community-based experiences.

UCSD facilities are the main sites for clinical education and are licensed for 500 beds. The majority of UCSD inpatients are admitted at UCSD Medical Center-Hillcrest, where a number of Regional Care Centers are located, including San Diego and Imperial Counties' only Level I Trauma Center. The UCSD Ambulatory Care Center is located across the street from the hospital tower.

In July 1993, a 120-bed general medical-surgical hospital, The John M. and Sally B. Thornton Hospital, opened at UCSD Medical Center-La Jolla which is located on the La Jolla campus. Adjacent to the Thornton Hospital is the Perlman Ambulatory Care Center and the Shiley Eye Center.

The Veterans Affairs Medical Center, located adjacent to the School of Medicine campus in La Jolla, also is an important training site. The UCSD School of Medicine's partnership with Children's Hospital and Health Center enables students to treat a significant number of the region's pediatric patients.

Outpatient experiences include private medical practice, community clinics, and home visitation programs. Students see patients in many of San Diego's most modern hospitals and outpatient facilities, as well as in some of the disadvantaged neighborhoods of San Diego and Baja California, Mexico.

In all of their clinical experiences UCSD medical students have an opportunity to see how physicians work as a team with physician assistants, nurses, nurse practitioners, laboratory technicians, social workers, physical and occupational therapists, pharmacists, and other health care professionals to provide health care. In many cases they also can see how the trend toward "managed care" affects both patients and the practice of medicine.

There are many opportunities for students to participate in cutting-edge research in laboratories of UCSD School of Medicine researchers, as well as in the laboratories of scientists from the general UCSD campus, the Veterans Affairs Medical Center, The Salk Institute, Scripps Clinic and Research Foundation, and some of the many private biomedical research companies in the region.

The medical school curriculum provides flexibility so that the individual needs and goals of each student can be met. The curriculum is divided into two major components: the core curriculum and the elective programs.

Elective opportunities constitute a substantial portion of classes during the first two years and close to 50 percent during the last two years. The core curriculum of the first two years is designed to provide each entering student an essential understanding of the fundamental disciplines underlying modern medicine. The core curriculum of the last two years is composed of the major clinical specialties taught in hospital settings, outpatient situations, and relevant extended-care facilities.

A Medical Scientist Training Program provides the opportunity for a limited number of students to earn both the M.D. and Ph.D. degrees over a six- to seven-year period of study.

The School of Medicine cooperates with the San Diego State University Graduate School of Public Health (SDSU-GSPH) in assisting interested students who wish to pursue a Master's Degree in Public Health (M.P.H.) while enrolled in medical school. Students can also receive an M.P.H. at other schools of public health, although a formal agreement exists only with the SDSU-GPSH.

The UCSD School of Medicine and the Department of Family and Preventive Medicine jointly offer a Master of Advanced Studies (MAS) in the Leadership of Healthcare Organizations. The degree program permits a student to complete the Doctor of Medicine (M.D.) curriculum and studies leading to a Master's Degree in the Leadership of Healthcare Organizations in a total of five years.

Each student is expected to develop an individualized program of independent study in conjunction with a faculty member and to describe it in writing.

Freshman student enrollment is 122, and a total of 535 medical students were enrolled in 2003–2004.

Selection Factors

Selection is based upon the nature and depth of scholarly and extracurricular activities undertaken, academic record, performance on the MCAT, letters of recommendation, and personal interviews.

The Admissions Committee gives serious consideration only to those applicants with above average GPA values and MCAT scores.
The School of Medicine is seeking a student body with a broad diversity of backgrounds and interests reflecting our diverse population.

A complete catalog and information on the foregoing programs are available on the school's Web page http://meded.ucsd.edu/Catalog/.

For additional information about the UCSD School of Medicine and its programs, write or call:

The Office of Admissions
School of Medicine, 0621
University of California, San Diego
9500 Gilman Drive
La Jolla, California 92093-0621
(858) 534-3880
somadmissions@ucsd.edu
http://meded.ucsd.edu/admissions

Programs for Prospective Medical Students

UCSD offers no special premedical major. An undergraduate student considering medicine as a career may choose any major or concentration area leading to the bachelor's degree, provided that he or she elects those additional courses which the medical school of his or her choice may require for admission. Admission requirements differ among medical schools, but most desire a solid foundation in the natural sciences–biology, chemistry, physics, mathematics–and a broad background in the humanities, social sciences, and communication skills. A premedical/dental advisory program is available through the campus-wide Career Services Center.

MASTER OF ADVANCED STUDIES (MAS) IN LEADERSHIP OF HEALTHCARE ORGANIZATIONS

The UCSD Department of Family and Preventive Medicine in the School of Medicine offers a Master of Advanced Studies (MAS) in the Leadership of Healthcare Organizations. The degree is designed to meet the needs of health care professionals who have clinical and executive or management responsibilities. All courses will be held in the late afternoon, evenings, and weekends for the convenience of working professionals. Extension's EdVantage provides administrative support for the program. Further information on the degree program may be obtained by contacting UCSD.

The School of Pharmacy and Pharmaceutical Sciences

The newest health sciences professional school on the UCSD campus is the School of Pharmacy and Pharmaceutical Sciences. Approved by the regents in summer 2000, the charter class of students was enrolled in fall 2002. Students study an innovative curriculum dedicated to educating future pharmacy practitioners to provide the pharmaceutical care needs of our growing and increasingly diverse society. The goal of the doctor of pharmacy curriculum is to prepare students to be leaders in the profession of pharmacy and to provide them with the tools to practice effectively in a wide variety of currently existing and potential future roles in academia, hospitals and clinics, long-term facilities and home care, government, health policy, the pharmaceutical industry, and innovative community pharmacy practice settings. It is expected that the emerging fields of pharmacogenomics and bioinformatics will have a profound influence on the future practice of pharmacy, and that graduates of the UCSD School of Pharmacy and Pharmaceutical Sciences will be in an excellent position to bring these advances to the patient care setting.

Future growth in enrollment in the School of Pharmacy and Pharmaceutical Sciences is planned for thirty students in the class entering in 2004 and sixty students in 2007. The Pharmaceutical Sciences Building, which will house the administrative, teaching, and research activities of the school, is scheduled for occupancy in fall 2005. Until these facilities are available, enrollment will be limited to a maximum of thirty students in each class. Once the building is available for occupancy, the entering class size is planned to increase to sixty students.

Rather than duplicate existing departments on the UCSD campus and in the School of Medicine, the founding faculty of the school draw upon the strengths of the basic and biomedical science departments that have provided an outstanding education to undergraduate, graduate, and medical students for more than thirty years. Faculty from campus departments and the School of Medicine join School of Pharmacy and Pharmaceutical Sciences faculty in teaching the preclinical courses in the curriculum. Clinical faculty, who are active practitioners in a variety of medical center, community, and industry locations, provide both classroom instruction as well as guidance of students during advanced pharmacy practice clinical experiences.

During the first years of implementation, the curriculum will be dynamic, under constant review, and using faculty and student input, updated by interdisciplinary faculty committees. Presently, the four-year curriculum leading to the doctor of pharmacy degree is designed as follows:

In the first year, students are enrolled in courses in anatomy and histology, pharmaceutical chemistry, pharmaceutics, bioinformatics, law and ethics, biostatistics and an introduction to the practice of pharmacy. Students gain their first exposure to patient care by working alongside medical students in UCSD sponsored, student-run, free medical clinics in San Diego. In the second year, pharmacy and first-year medical students are concurrently enrolled in courses that serve as a foundation for understanding disease and disease management. In this unique environment, pharmacy and medical students study cell biology and biochemistry, organ physiology, pharmacology, neurosciences and endocrinology, reproduction and metabolism, laboratory medicine, and health policy. This is another step in developing the collegial relationship they encounter in the patient-care setting. Courses, specific to the needs of pharmacy students, such as additional course work in pharmacology, drug study design, and pharmacy practice are also provided. The third year focuses on the application of the information learned in the previous years with additional course work in microbiology, pharmacology, drug information, pharmaceutical chemistry, pharmaceutics, and pharmacogenomics. A major course sequence in drug therapeutics begins the process of applying the knowledge gained in the basic sciences to the clinical management and care of patients. The fourth year is devoted entirely to advanced pharmacy practice clinical experiences where students learn to apply the skills and knowledge obtained in the curriculum in a variety of patient care settings. Many of these advanced practice experiences take place at UCSD-affiliated medical centers, such as UCSD Medical Center–Hillcrest, UCSD Medical Center– La Jolla, the Veteran's

Administration Medical Center in La Jolla, and San Diego Children's Hospital and Medical Center. In addition, many other health care facilities throughout the region are utilized. Not only do students participate in the care of patients in many of the most modern medical facilities in the San Diego area, but they also learn to appreciate the challenges faced in providing care to some of the less advantaged citizens of the region. Both classroom elective courses as well as advanced practice experience electives provide flexibility for the student to explore the many facets of the profession and provide an opportunity for the curriculum to meet a particular student's educational goals and objectives.

The San Diego region ranks third in the nation in the development of new biotechnology. The school is developing relationships with this burgeoning biotechnology industry, which is adjacent to the UCSD campus. There are advanced practice and research experiences available to students in these exciting new areas of practice.

The common required and elective course work taken by pharmacy and medical students and advanced practice clinical experiences where medical and pharmacy students work closely together have been created to foster the development of cooperation between the professions as well as to develop an appreciation for the unique roles that each professional provides in the care of patients.

For the past twenty-five years, UCSF School of Pharmacy students have been enrolled in advanced practice clinical activities at UCSD Medical Centers. This long-standing relationship is continuing. The two schools are utilizing distance-learning facilities to enhance communication and to share educational and research experiences between students and faculty on the two campuses.

Selection Factors

The Admissions Committee seeks a diverse pool of applicants who have demonstrated strong academic ability in both the required prerequisite course work and in their entire academic career as well as a wide breadth of extracurricular interests. In addition, the committee selects applicants for matriculation who have demonstrated the personal qualities of intelligence, maturity, integrity, dedication to the ideal of service to society, and who are best suited for meeting the educational goals of the school. The ability to express oneself clearly in both oral and written English is essential. The School of Pharmacy and Pharmaceutical Sciences is committed to admitting students with diverse cultural, economic, and social backgrounds. Although grade-point average is an important factor, it is not the sole criterion for acceptance. In addition to intellectual and academic competence, the Admissions Committee considers communication skills, leadership ability, community service, and health care-related experience. Preference for admission is afforded to California residents when all other selection factors are equal, and consideration at this time is given only to applicants who are either United States citizens or permanent residents.

All students are enrolled in the full-time, four-year professional program leading to the doctor of pharmacy degree (Pharm.D.). No students in advanced standing, transfer students from other schools of pharmacy, or part-time students are accepted. All students enter at the first-year level.

The faculty of the School of Pharmacy and Pharmaceutical Sciences is exploring the implementation of a seven-year B.S./Pharm.D. program and a Pharm.D./Ph.D. program. As development of each program matures, information will be made available on the School of Pharmacy Web site. It is not anticipated that the programs will be ready for student enrollment until fall 2005.

For additional information about the UCSD School of Pharmacy and Pharmaceutical Sciences, visit the school Web site, write, call, or email:

University of California, San Diego
School of Pharmacy and Pharmaceutical Sciences
9500 Gilman Drive, MC 0657
La Jolla, California 92093-0657
(858) 822-4900
General Email: pharmacy@ucsd.edu
Admissions Office Email:
sppsadmissions@ucsd.edu
Web site: http://pharmacy.ucsd.edu

Scripps Institution of Oceanography

Scripps Institution of Oceanography is one of the oldest, largest, and most important centers for marine science research, graduate training, and public service in the world. Its preeminence in the marine sciences is reflective of its excellent programs, distinguished faculty and research scientists, and outstanding facilities.

Scripps Institution was founded in 1903 as an independent biological research laboratory, which became an integral part of the University of California in 1912. At that time the laboratory was given the Scripps name in recognition of donors Ellen Browning Scripps and E.W. Scripps.

In all, Scripps occupies sixty-seven buildings on 230 acres mostly along the Pacific coastline below the mesa on which UCSD is located. Its staff numbers approximately 1,300, including more than 200 graduate students. The institution's annual expenditures exceed $140 million.

Research at Scripps encompasses physical, chemical, biological, geological, and geophysical studies of the oceans. Among the hundreds of research programs that may be under way at any one time are studies of air-sea interaction, climate prediction, earthquakes, the physiology of marine animals, marine chemistry, beach erosion, the marine food chain, the ecology of marine organisms, the geological history of the ocean basins, and the multidisciplinary aspects of global change and the environment.

Scripps operates four ships and one platform for oceanographic research in support of programs by Scripps researchers as well as oceanographers from other institutions throughout the world. Cruises range from local, limited-objective trips to far-reaching expeditions in the world's oceans.

Investigations supported by contracts and grants, primarily federal, cover a wide latitude of marine research. The general research effort is conducted by five divisions: Climate Research Division (CRD), Geosciences Research Division (GRD), Integrative Oceanography Division (IOD), Marine Biology Research Division (MBRD), and Physical Oceanography Research Division (PORD). The diversity of Scripps's work is extended by special purpose laboratories and multidisciplinary centers: Marine Physical Laboratory (MPL), Center for Marine Biotechnology and Biomedicine (CMBB), Center for Atmospheric Sciences (CAS), Center for Marine Biodiversity and Conservation (CMBC), Center for Observations, Modeling, and Prediction at Scripps (COMPAS), and Center for Marine Genomics (CMG).

The La Jolla laboratory of the University of California's Cecil H. and Ida M. Green Institute of Geophysics and Planetary Physics, and UC's California Space Institute, although organizationally separate, are closely affiliated with Scripps.

Other specialized groups also are located on campus. The California Sea Grant College Program, a systemwide program with more than forty projects and approximately forty-five trainees supported on California campuses and in several specialized research units, is headquartered at Scripps. The Southwest Fisheries Science Center (SWFSC), located near the Scripps campus, is one of thirty major laboratories and centers operated by the National Marine Fisheries Service, a component of the National Oceanic and Atmospheric Administration of the U.S. Department of Commerce. Also, the Inter-American Tropical Tuna Commission is colocated at SWFSC.

A ship operations and marine technical support unit provides essential services and facilities to all research units of the institution.

The Birch Aquarium at Scripps provides a wide variety of educational courses in the marine sciences for students from primary grades to high school level. UCSD students may become involved in work-study programs or serve as volunteers or aquarist trainees. A limited number of students can be accommodated for a four-unit course in independent study by arrangement with a faculty member and the aquarium director. The facility's resources include natural habitat groupings of marine life from local and Gulf of California waters; many of these marine groups are on display in the aquarium. The museum exhibits present basic oceanography concepts and explain research undertaken at Scripps. The aquarium is open from 9:00 a.m. to 5:00 p.m. daily.

Scripps's educational program has grown hand in hand with the research programs. Instruction is on the graduate level, and students are admitted as candidates for a Ph.D. degree. Academic work is conducted through an organizational segment of the institution known as the Graduate Department of Scripps and its eight curricular groups: biological oceanography, physical oceanography, marine biology, geological sciences, marine chemistry and geochemistry, geophysics, climate sciences, and applied ocean sciences. Approximately ninety professors are complemented by an academic staff of more than 200 research scientists, many of whom have a regularly scheduled role in the instructional program. Many Scripps scientists also teach courses in undergraduate programs such as biology, earth sciences, and environmental systems.

Students enter oceanography with extremely varied interests and backgrounds—naturalists, explorers, engineers, and theorists from the United States and many foreign countries. One thing they have in common, however, is that they come to Scripps with a very strong understanding of science. Most students select positions as research assistants when they enter the program—a practice that not only gives them an early involvement with research, but also provides salaries. The student-faculty ratio at Scripps is about two to one; consequently, classes are small, and the student has the opportunity to work closely with his or her thesis adviser. Oceanography is an interdisciplinary field that allows for informal exchange and interaction on a variety of levels.

While at Scripps, students have for their use some of the nation's most sophisticated and complete special laboratories and facilities for oceanographic studies covering a wide range of disciplines from biology and physiology to geophysics and atmospheric sciences. The Hydraulics Laboratory features a unique 90-foot stratified flow channel and a unique 150-foot wind-wave channel, and the Analytical Facility has scanning electron microscopes and other high-precision instruments. Among the many computer resources is access to the San Diego Supercomputer Center. The Scripps Library is the University of California's major collection of marine science materials, with outstanding collections in oceanography, marine biology, and marine technology. It also specializes in atmospheric sciences, fisheries, geology, geophysics, and zoology. The various marine life

and geological specimens housed at Scripps form a vast "library" of oceanographic resources available for investigations. Two underwater research areas that are part of the UC Natural Reserve System are adjacent to the Scripps campus. During a student's tenure at Scripps, he or she will have the opportunity to go to sea on any of Scripps's four research vessels as well as those from other oceanographic institutions.

The combination of a large scientific staff and extensive facilities at Scripps provides an extraordinary opportunity for each student to enjoy close contact with existing oceanographic concepts and active participation in research.

See "Scripps Institution of Oceanography" in "Courses, Curricula, and Programs of Instruction" for further details on study programs, requirements, degrees, and courses.

For additional information, write:

Graduate Student Information
Scripps Institution of Oceanography
University of California, San Diego
9500 Gilman Drive, Dept. 0208
La Jolla, California 92093-0208

Graduate School of International Relations and Pacific Studies

The Graduate School of International Relations and Pacific Studies (IR/PS), at the University of California, San Diego was created by the Board of Regents in 1986 as the University of California's first professional school of international affairs. The school's regional focus is on the Pacific Rim, which extends from the southernmost tip of Latin America northward, across the United States and Canada, down through the Soviet Union, Japan, China, Korea, the Philippines, Australia, New Zealand, and the other nations of Oceania.

The school's programs have been developed in response to the increasing participation of the United States in global economic and political affairs. The United States wields less economic and political influence than it did in the immediate postwar years; at the same time, American industries face increasing competitive pressures in domestic and international markets. As a result, professionals who can understand and work in an internationalized environment are needed in both the public and private sectors. Moreover, while the United States once looked primarily to Europe as the site of its major commercial, financial, and strategic interests, the United States now has large stakes in the Pacific Basin, a likely source of both our greatest national challenges and possibilities in the next decades. These changes create both a need and an opportunity: a need for new programs of training and research in international affairs and an opportunity for a new school of international affairs and management to develop a distinctive, modern program that links professional training with international competence and gives greater prominence to the Pacific Basin.

The school's primary objectives are to prepare students with an interest in the Pacific Rim countries for positions of leadership in business, government, journalism, diplomacy, public service, and other fields; to serve as a center of excellence for research on economic, political, social, technological, and security issues confronting those nations; and to promote dialogue on Pacific region issues of common concern.

1. The degree programs provide students with professional training for careers in international affairs and management, including jobs in industry, government, international organizations, foundations, schools, and research institutes. Whatever their specific goals, students receive a broad training across professional areas so that those headed for the government have a grasp of decisions in the private sector and those planning business careers acquire a grasp of decision-making in public organizations. A program combining applied social science and professional subjects with courses on Pacific region countries provides students with both general skills and particular knowledge of the history, culture, language, and contemporary situations of those countries.
2. The school serves as a center for research on issues of common concern to the nations of the Pacific Rim. Since the Pacific Rim countries have become important foci of economic and security relations, the need for information and research centered on this dynamic region has become urgent. The diversity of national experiences represented by the Pacific region countries suggests a research agenda that includes comparisons of different approaches to economic management, foreign relations, policymaking, and development.
3. As part of the University of California, the school plays an important role in developing public awareness and understanding of the Pacific region. Programs of public outreach contribute to the information available to citizens and specialized groups about international issues that affect their lives.

Degree Programs

The degrees offered by the school include a professional Master of Pacific International Affairs (M.P.I.A.), a Ph.D. in Political Science and International Affairs offered jointly with the Department of Political Science, and a Ph.D. in Economics and International Affairs offered jointly with the Department of Economics. Training emphasizes international relations, economics and management, international technology management, policy, knowledge of specific countries or regions, analytical and research skills, and foreign language.

Mid-career and other executive certificate programs are also offered by IR/PS. In particular,

the International Career Associates Program (ICAP) is designed for working professionals seeking additional study in international management, international relations, and comparative public policy. Participants in the program spend an academic year at IR/PS beginning in mid-September and ending in mid-June. Under the auspices of the program, associates have the opportunity to further internationalize their knowledge and experience as well as enhance their professional development in such areas as finance, accounting, quantitative methods, econometrics, and long-range strategic planning. The program of study is tailored to individual interests under the guidance of the program's director and faculty advisers.

The M.P.I.A. program is distinctive in several respects. The program:

1. Exposes students to the perspectives of both private business and public policymaking.
2. Offers specialized training in economics, management, international relations, and political analysis and integrates the languages, history, and cultures of the Pacific region into the curriculum.
3. Creates a laboratory for comparative analysis of economic management, foreign relations, policymaking, and development in the diverse countries of the Pacific region.
4. Offers language skills training necessary for international affairs professionals specializing in Pacific Rim countries.

The Ph.D. in International Affairs is offered only in conjunction with either the Ph.D. in political science or the Ph.D in economics. These Ph.D. programs are designed for students who seek a rigorous training in a discipline (either economics or political science) along with a specialization in a specific policy area and regional expertise. Ph.D. students will be required to demonstrate knowledge of a foreign language linked to their regional specialization.

The master's and Ph.D. programs are distinct and separate. There is little overlap in the structure or requirements of the two programs because their objectives are very different. The master's program provides professional training for graduates who will pursue international careers in business, government, journalism, and other fields. The Ph.D. programs offer an academic education to a small number of students who will pursue international careers requiring advanced research capabilities in universities, corporations, government agencies, consulting firms, or other research organizations.

The master's and Ph.D. programs do share a common intellectual framework. Both the professional master's curriculum and the academic Ph.D. curriculum are designed to bring the theories, methods, and insights of various disciplines together to analyze policy issues of the Pacific region and to blend the perspectives of public policy makers and private managers. The same faculty teach and advise students in both the master's and Ph.D. programs.

The Faculty

The school has attracted an interdisciplinary faculty from such fields as economics, management sciences, international relations, comparative politics, public policy, and linguistics. The various programs draw upon and contribute to research which focuses on the regions of the Pacific Rim and on major issues that affect the region.

The school places special emphasis on research in and teaching of topics of particular importance to the program. These topics currently include:

1. The Pacific Rim as system, including the interaction of the countries and regions within it (e.g., Latin American-Japanese economic relations, U.S. relations with both East Asia and Latin America, and the placement of the Pacific in the global system of international relations, both contemporary and historical).
2. Studies in international economics, management, and finance, including such subject areas as international competition, comparative industrial organizations, international trade and development, industrial relations, technological innovation, international financial structures, policies, institutions, and historical patterns of development.
3. Comparison of the trajectories of socioeconomic development among the countries of Asia and Latin America, including the exploration of differences and similarities in state-society relations, culture, entrepreneurship, linkage to the global economy, and geopolitical position.
4. Comparative analysis of patterns of policymaking in the countries of the Pacific region to understand how different governmental structures, economic systems, and social group interests shape the policy process and influence policy choices in such areas as budget allocation, regulation of industry, and foreign trade.

For further information, contact the Office of Admissions, Graduate School of International Relations and Pacific Studies, UCSD, 9500 Gilman Drive, La Jolla, CA 92093-0520. (858) 534-5914, email: irps-apply@ucsd.edu, Web site: http://www-irps.ucsd.edu.

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Epstein, Steven	Associate Professor	Sociology	Warren
Erickson, Gregory F.	Professor	Reproductive Medicine	SchMed
Erie, Steven P.	Professor	Political Science	Marshall
Esener, Sadik C.	Professor	ECE	Warren
Esherick, Joseph	Professor	History	Roosevelt
Esko, Jeffrey	Professor	CMM	SchMed
Eskin, Eleazar	Assistant Professor-in-Residence	CSE	Revelle
Espiritu, Yen Le	Professor	Ethnic Studies	Marshall
Evans, Ivan T.	Associate Professor	Sociology	Roosevelt
Evans, John H.	Associate Professor	Sociology	Roosevelt
Evans, John W.	Professor Emeritus	Mathematics	Muir/SchMed
Evans, Ronald J.	Professor	Mathematics	Marshall
Fagin, Steve	Professor	Visual Arts	Marshall
Fahey, Robert C.	Professor Emeritus	Chemistry and Biochemistry	Revelle
Fainman, Yeshaiahu	Professor	ECE	Warren
Fanestil, Darrell D.	Professor Emeritus	Medicine	SchMed
Fantino, Edmund J.	Professor	Psychology	Muir
Farber, Manny	Professor Emeritus	Visual Arts	Muir
Farquhar, Marilyn G.	Professor	CMM	SchMed
Farrell, Peter	Professor Emeritus	Music	Warren
Fauconnier, Gilles R.	Professor	Cognitive Science	Marshall
Feher, George	Professor Emeritus	Physics	Revelle
Feinberg, Richard E.	Professor	IRPS	IRPS
Fejer, Jules A.	Professor Emeritus	ECE	Muir
Felbeck, Horst	Professor	SIO	SIO
Feldman, Daniel E.	Assistant Professor	Biological Sciences—Neurobiology	Roosevelt
Feller, Marla B.	Assistant Professor	Biological Sciences—Neurobiology	Marshall
Fenical, William H.	Professor	SIO	SIO
Fenner-Lopez, Claudio E.	Lecturer (SOE) Emeritus	Visual Arts/Communication	Marshall
Feramisco, James R.	Professor	Medicine/Pharmacology	SchMed
Ferrante, Jeanne	Professor	CSE	Roosevelt
Ferree, Karen	Assistant Professor	Political Science	Revelle
Ferreira, Victor	Associate Professor	Psychology	Marshall
Fialko, Yuri A.	Assistant Professor	SIO/IGPP	SIO
Fields, Gary	Assistant Professor	Communication	Warren
Fierer, Joshua	Professor-in-Residence	Medicine/Pathology	SchMed
Fillmore, Jay P.	Professor Emeritus	Mathematics	Muir
Finney, Nathaniel S.	Assistant Professor	Chemistry and Biochemistry	Muir
Firtel, Richard A.	Professor	Biological Sciences—Cell and Developmental Biology	Revelle
Fisk, Zachary	Professor Emeritus	Physics	Muir
FitzGerald, Carl H.	Professor	Mathematics	Revelle
Fitzsimmons, Patrick J.	Professor	Mathematics	Marshall
Flavin, Marjorie	Associate Professor	Economics	Roosevelt
Fogler, Michael	Assistant Professor	Physics	Sixth
Fonville, John W.	Professor	Music	Revelle
Forbes, Camille	Assistant Professor	Literature	Sixth
Forbes, Douglass Jane	Professor	Biological Sciences—Cell and Developmental Biology	Muir
Ford, Joseph	Associate Professor	ECE	Muir
Forman-Barzilai, Fonna	Assistant Professor	Political Science	Sixth

Fortes, P. A. George	Associate Professor	Biological Sciences—Neurobiology	Marshall
Frangos, John A.	Professor	Bioengineering	Warren
Frank, Ross H.	Associate Professor	Ethnic Studies	Marshall
Frankel, Theodore T.	Professor Emeritus	Mathematics	Revelle
Franks, Peter J. S.	Professor	SIO	SIO
Fredkin, Donald R.	Professor	Physics	Revelle
Freedman, David Noel	Professor	History	Revelle
Frenk, Margit	Professor Emeritus	Literature	Marshall
Friedman, Richard E.	Professor	Literature	Muir
Friedmann, Theodore	Professor	Pediatrics	SchMed
Frieman, Edward A.	Professor Emeritus/Vice Chancellor Emeritus	SIO/Marine Sciences	SIO
Fry, Andrew	Assistant Professor	Music	Marshall
Frymer, Paul	Associate Professor	Sociology	Revelle
Fu, Xiang-Dong	Associate Professor	CMM	SchMed
Fujitani, Takashi	Associate Professor	History	Roosevelt
Fuller, George M.	Professor	Physics	Roosevelt
Fung, Yuan-Cheng B.	Professor Emeritus	Bioengineering	Revelle
Gaasterland, Terry	Professor	SIO/MBRD	SIO
Gaffney, Floyd	Professor Emeritus	Theatre and Dance	Marshall
Galambos, Robert	Professor Emeritus	Neurosciences	SchMed
Galton, Ian	Professor	ECE	Muir
Gan, Wee Teck	Assistant Professor	Mathematics	Warren
Garsia, Adriano M.	Professor	Mathematics	Revelle/SchMed
Gee, Jeffrey	Professor-in-Residence	SIO/GRD	SIO
Geiduschek, E. Peter	Professor Emeritus	Biological Sciences—Molecular Biology	SchMed/Roosevelt
George, Rosemary M.	Associate Professor	Literature	Roosevelt
George-Graves, Nadine	Associate Professor	Theatre and Dance	Revelle
Getoor, Ronald K.	Professor Emeritus	Mathematics	Revelle/SchMed
Geyer, Mark A.	Professor-in-Residence	Psychiatry	SchMed
Ghosh, Anirvan	Professor	Biological Sciences—Neurobiology	Muir
Ghosh, Gourisankar	Associate Professor	Chemistry and Biochemistry	Marshall
Ghosh, Partho	Associate Professor	Chemistry and Biochemistry	Roosevelt
Gibson, Carl H.	Professor	MAE/SIO	Revelle/SIO
Gibson, Clark	Associate Professor	Political Science	Muir
Gieskes, Joris M.T.M.	Professor	SIO	SIO
Gilbert, J. Freeman	Professor Emeritus	SIO	SIO
Giles, Wayne	Professor-in-Residence	Bioengineering/Medicine	Warren/SchMed
Gill, Gordon N.	Professor	Medicine/CMM	SchMed
Gill, Philip E.	Professor	Mathematics	Marshall
Gille, Sarah T.	Assistant Professor	SIO/MAE	SIO/Revelle
Gilpin, Michael E.	Professor Emeritus	Biological Sciences—Ecology, Behavior, and Evolution	Muir
Glass, Christopher K.	Professor	Medicine	SchMed
Gleditsch, Kristian S.	Assistant Professor	Political Science	Warren
Glymour, Clark	Professor	Philosophy	Roosevelt
Goddard, Joseph D.	Professor	MAE	Marshall
Goguen, Joseph	Professor	CSE	Roosevelt
Goldberg, Edward D.	Professor Emeritus	SIO	SIO
Goldberger, Marvin	Professor	Physics	Warren
Goldfarb, Brian D.	Assistant Professor	Communication	Revelle
Goldman, Harvey S.	Professor	Sociology	Marshall
Goldrath, Ananda	Assistant Professor	Biological Sciences—Molecular Biology	Marshall

Goldstein, Lawrence S.B.	Professor	Pharmacology	SchMed
Goldstein, Paul S.	Associate Professor	Anthropology	Revelle
Goodall, Grant	Professor	Linguistics	Warren
Goodblatt, David	Professor	History	Muir
Goodkind, John M.	Professor	Physics	Revelle
Goodman, Murray	Professor	Chemistry and Biochemistry	Revelle
Goodson, James	Assistant Professor	Psychology	Warren
Gordon, Nora	Assistant Professor	Economics	Roosevelt
Gordon, Roger H.	Professor	Economics	Warren
Gorin, Jean-Pierre	Professor	Visual Arts	Marshall
Gorman, Michael R.	Assistant Professor	Psychology	Roosevelt
Gough, David A.	Professor	Bioengineering	Marshall
Gould, Meredith	Lecturer (PSOE)	Biological Sciences—Cell and Developmental Biology	Warren
Gould, Robert J.	Professor Emeritus	Physics	Revelle
Goulian, Mehran	Professor Emeritus	Medicine	SchMed
Gourevitch, Peter A.	Professor	IRPS/Political Science	IRPS/Roosevelt
Graham, Fan Chung	Professor	Math/CSE	Muir
Graham, Ronald L.	Professor	CSE	Roosevelt
Granger, Clive W.J.	Professor Emeritus	Economics	Warren
Granholm, Eric L.	Associate Professor-in-Residence	Psychiatry	SchMed
Grant, Igor	Professor	Psychiatry	SchMed
Green, Allyson	Associate Professor	Theatre and Dance	Sixth
Green, Melvin H.	Professor Emeritus	Biological Sciences	Revelle
Greenstein, Jack M.	Associate Professor	Visual Arts	Muir
Griest, Kim	Professor	Physics	Roosevelt
Grinstein, Benjamin	Professor	Physics	Muir
Griswold, William G.	Professor	CSE	Warren
Groisman, Alexander	Assistant Professor	CSE	Sixth
Gross, Mark W.	Professor	Mathematics	Revelle
Groves, Philip M.	Professor Emeritus	Psychiatry/Neurosciences	SchMed
Groves, Theodore	Professor	Economics	Revelle
Grush, Rick	Associate Professor	Philosophy	Roosevelt
Guest, Clark C.	Associate Professor	ECE	Warren
Gupta, Rajesh	Professor	CSE	Warren
Gusfield, Joseph R.	Professor Emeritus	Sociology	Muir
Gutierrez, David G.	Associate Professor	History	Marshall
Gutiérrez, Ramón A.	Professor	Ethnic Studies	Marshall
Guy, Nancy	Assistant Professor	Music	Roosevelt
Guza, Robert T.	Professor	SIO	SIO
Haas, Richard H.	Professor	Neurosciences/Pediatrics	SchMed
Haff, Leonard R.	Professor	Mathematics	Marshall
Haggard, Stephan M.	Professor	IRPS	IRPS
Hajnal, Zoltan L.	Assistant Professor	Political Science	Marshall
Halberstam, Judith M.	Professor	Literature	Revelle
Halkin, Hubert	Professor Emeritus	Mathematics	Revelle
Halleck, DeeDee	Professor Emeritus	Communication	Warren
Hallin, Daniel C.	Professor	Communication	Marshall
Hamburger, Robert N.	Professor Emeritus	Pediatrics	Revelle/SchMed
Hamilton, James D.	Professor	Economics	Roosevelt
Hammel, Harold T.	Professor Emeritus	SIO	SIO/SchMed
Hampton, Randolph	Associate Professor	Biological Sciences—Cell and Developmental Biology	Warren

Hanson, Gordon	Professor	IRPS/Economics	IRPS/Warren
Hardimon, Michael	Associate Professor	Philosophy	Marshall
Harel, Guershon	Professor	Mathematics	Marshall
Harkins, Edwin L., Jr.	Professor	Music	Muir
Harper, Elvin	Professor Emeritus	Chemistry and Biochemistry	Marshall
Harris, Christine	Assistant Professor	Psychology	Revelle
Harrison, Helen M.	Professor Emeritus	Visual Arts	Roosevelt
Harrison, Newton A.	Professor Emeritus	Visual Arts	Roosevelt
Hartouni, Valerie A.	Associate Professor	Communication	Muir
Hasson, Tama	Assistant Professor	Biological Sciences—Cell and Developmental Biology	Roosevelt
Hastings, Philip A.	Associate Professor	SIO	SIO
Hasty, Jeffrey	Assistant Professor	Bioengineering	Marshall
Haubrich, Richard A.	Professor Emeritus	SIO	SIO
Hauger, Richard L.	Professor-in-Residence	Psychiatry	SchMed
Havis, Allan	Professor	Theatre and Dance	Muir
Hawkins, James W.	Professor	SIO	Revelle/SIO
Haxo, Francis T.	Professor Emeritus	SIO	SIO
Hayashi, Masaki	Professor Emeritus	Biological Sciences—Cell and Developmental Biology	Revelle
Haydu, Jeffrey M.	Professor	Sociology	Roosevelt
Haygood, Margo G.	Professor	SIO	SIO
Heaton, Robert K.	Professor	Psychiatry	SchMed
Hedrick, Stephen M.	Professor	Biological Sciences—Molecular Biology/ CMM	Marshall/SchMed
Hegemier, Gilbert A.	Professor	SE	Revelle
Helinski, Donald R.	Professor Emeritus	Biological Sciences—Molecular Biology	Marshall
Heller, Michael J.	Professor/Professor-in-Residence	Bioengineering/ECE	Revelle
Hellman, Frances	Professor	Physics	Marshall
Helstrom, Carl W.	Professor Emeritus	ECE	Muir
Helton, J. William	Professor	Mathematics	Marshall
Henaff, Marcel	Professor	Literature	Warren
Hendershott, Myrl C.	Professor	SIO	SIO
Hendrickson, David N.	Professor	Chemistry and Biochemistry	Muir
Hertz, Deborah	Professor	History	Revelle
Herz, Richard K.	Associate Professor	MAE	Warren
Hessler, Robert R.	Professor Emeritus	SIO	SIO
Heyman, Gail D.	Assistant Professor	Psychology	Warren
Hildebrand, John A.	Professor	SIO	SIO
Hillyard, Steven A.	Professor	Neurosciences	SchMed
Hilton, David R.	Associate Professor	SIO	SIO
Hirsch, Jorge E.	Professor	Physics	Revelle
Ho, Steffan	Assistant Professor	Pathology	SchMed
Hock, Louis J.	Professor	Visual Arts	Marshall
Hodgkiss, William S., Jr.	Professor	SIO	SIO
Hoekstra, Hopi	Assistant Professor	Biological Sciences—Ecology, Behavior and Evolution	Sixth
Hoffman, Alexander	Assistant Professor	Chemistry and Biochemistry	Marshall
Hofmann, Alan F.	Professor Emeritus	Medicine	SchMed
Hoger, Anne	Professor	MAE	Warren
Hollan, James D.	Professor	Cognitive Science	Revelle
Holland, John J.	Professor Emeritus	Biology	Warren
Holland, Nicholas D.	Professor	SIO	SIO/Revelle

Holst, Michael J.	Professor	Mathematics	Warren
Holston, James	Associate Professor	Anthropology	Warren
Holway, David A.	Assistant Professor	Biological Sciences—Ecology, Behavior, and Evolution	Muir
Horwitz, Robert B.	Professor	Communication	Marshall
Hoshi, Takeo	Professor	IRPS	IRPS/Roosevelt
Hoston, Germaine A.	Professor	Political Science	Revelle
Houston, Alan C.	Associate Professor	Political Science	Roosevelt
Howden, William E.	Professor	CSE	Muir
Howe, Fanny Q.	Professor Emeritus	Literature	Warren
Howell, Stephen B.	Professor	Medicine	SchMed
Hu, Ping C.	Lecturer (SOE)	History	Muir
Hu, Te C.	Professor	CSE	Warren
Huang, Xiaohua	Assistant Professor	Bioengineering	Revelle
Huber, Gary	Assistant Professor	Bioengineering	Roosevelt
Huelsenbeck, John	Associate Professor	Biological Sciences—Ecology, Behavior and Evolution	Marshall
Huerta, Jorge A.	Professor	Theatre and Dance	Marshall
Hughes, Judith M.	Professor	History	Roosevelt
Humphries, Tom L.	Lecturer (SOE)	TEP/Communication	Marshall
Hunefeldt, Christine F.	Professor	History	Marshall
Hutchins, Edwin L., Jr.	Professor	Cognitive Science	Revelle
Hwa, Terence T.	Professor	Physics	Revelle
Ideker, Trey	Assistant Professor	Bioengineering	Warren
Ierley, Glenn R.	Professor	SIO	SIO
Impagliazzo, Russell	Professor	CSE	Marshall
Inman, Douglas L.	Professor Emeritus	SIO	SIO
Insel, Paul A.	Professor	Pharmacology/Medicine	SchMed
Intaglietta, Marcos	Professor	Bioengineering	Revelle/SchMed
Intriligator, Kenneth	Professor	Physics	Muir
Iragui-Madoz, Vicente J.	Professor of Clinical Neurosciences	Neurosciences	SchMed
Irons, Peter H.	Professor	Political Science	Marshall
Jackson, Gabriel	Professor Emeritus	History	Revelle
Jackson, Jeremy	Professor	SIO	SIO
Jacobson, Gary C.	Professor	Political Science	Marshall
Jain, Ramesh C.	Professor Emeritus	ECE/CSE	Roosevelt
James, Luther	Associate Professor Emeritus	Theatre and Dance	Muir
Januszewski, Silke I.	Assistant Professor	Economics	Warren
Jed, Stephanie H.	Associate Professor	Literature	Muir
Jenik, Adriene	Associate Professor	Visual Arts	Roosevelt
Jenkins, Elizabeth	Professor	Physics	Muir
Jennings, Patricia	Professor	Chemistry and Biochemistry	Roosevelt
Jensen, Henrik	Assistant Professor	CSE	Muir
Jeremijenko, Natalie	Assistant Professor	Visual Arts	Sixth
Jernigan, Terry L.	Professor-in-Residence	Psychiatry/Radiology	SchMed
Jeste, Dilip V.	Professor-in-Residence	Psychiatry	SchMed
Jin, Sungho	Professor	MAE	Sixth
Johnson, Catherine L.	Associate Professor	SIO/IGPP	SIO
Johnson, Chalmers	Professor Emeritus	IRPS	IRPS/Roosevelt
Johnson, Randall S.	Assistant Professor	Biological Sciences—Molecular Biology	Marshall
Johnson , Tracy	Assistant Professor	Biological Sciences—Molecular Biology	Revelle

Johnson La-O, Sara E.	Assistant Professor	Literature	Roosevelt
Jones, Barbara	Professor	Physics	Muir
Jones, Walton	Professor	Theatre and Dance	Muir
Jordan, David K.	Professor/Provost	Anthropology/Warren	Warren
Joseph, Simpson	Assistant Professor	Chemistry and Biochemistry	Roosevelt
Judd, Lewis L.	Professor	Psychiatry	SchMed
Jules-Rosette, Bennetta W.	Professor	Sociology	Muir
Kadonaga, James T.	Professor	Biological Sciences—Molecular Biology	Revelle
Kagnoff, Martin F.	Professor	Medicine/Pediatrics	SchMed
Kahler, Miles E.	Professor	IRPS	IRPS
Kahng, Andrew B.	Professor	CSE/ECE	Revelle
Kahr, Madlyn M.	Professor Emeritus	Visual Arts	Warren
Kamps, Mark P.	Associate Professor	Pathology	SchMed
Kane, Alex	Professor	IRPS	IRPS/Roosevelt
Kaprow, Allan	Professor Emeritus	Visual Arts	Warren
Karbhari, Vistasp M.	Professor	SE	Muir
Karin, Michael	Professor	Pharmacology	SchMed
Karin, Sidney	Professor-in-Residence	CSE	Warren
Karis, Aleck	Professor	Music	Warren
Karten, Harvey J.	Professor	Neurosciences/Psychiatry	SchMed
Kassner, Michael E.	Professor	MAE	Warren
Kastner, Miriam	Professor	SIO	SIO/Revelle
Katzman, Robert	Professor Emeritus	Neurosciences	SchMed
Kayali, Hasan	Associate Professor	History	Roosevelt
Kearns, David R.	Professor Emeritus	Chemistry and Biochemistry	Revelle
Keating, Brian	Assistant Professor	Physics	Muir
Keeling, Charles D.	Professor Emeritus	SIO	SIO
Keeling, Ralph F.	Professor	SIO	SIO
Kehler, Andrew	Assistant Professor	Linguistics	Roosevelt
Kelly, Carolyn J.	Professor-in-Residence	Medicine	SchMed
Kelner, Michael J.	Professor	Pathology	SchMed
Kelsoe, John R., Jr.	Associate Professor	Psychiatry	SchMed
Kennel, Charles F.	Professor/Vice Chancellor/Director	SIO/Marine Sciences	SIO
Kernell, Samuel H.	Professor	Political Science	Warren
Kester, Grant	Associate Professor	Visual Arts	Roosevelt
King, Nicole R.	Associate Professor	Literature	Marshall
Kipps, Thomas J.	Professor	Medicine	SchMed
Kirkland, Theo N., III	Professor-in-Residence	Pathology/Medicine	SchMed
Kirkpatrick, Susan	Professor/Associate Chancellor	Literature	Muir
Kirsch, David J.	Associate Professor	Cognitive Science	Roosevelt
Klatch, Rebecca E.	Professor	Sociology	Muir
Klein, Rachel	Associate Professor	History	Warren
Kleinfeld, David	Professor	Physics	Warren
Klima, Edward S.	Professor Emeritus	Linguistics	Muir
Klimenko, Mikhail M.	Assistant Professor	IRPS	IRPS
Kluender, Robert E.	Associate Professor	Linguistics	Warren
Knowlton, Nancy	Professor	SIO	SIO
Kobayashi, Yoshihisa	Assistant Professor	Chemistry and Biochemistry	Revelle
Kogut, Sandra	Associate Professor	Visual Arts	Sixth
Kohn, Joshua R.	Associate Professor	Biological Sciences—Ecology, Behavior, and Evolution	Warren
Kokotovic, Milos	Assistant Professor	Communication	Muir

Kolodner, Richard D.	Professor	Medicine	SchMed
Komives, Elizabeth A.	Professor	Chemistry and Biochemistry	Roosevelt/SchMed
Konecni, Vladimir J.	Professor	Psychology	Muir
Kontje, Todd C.	Professor	Literature	Marshall
Koo, Edward	Professor	Neurosciences	SchMed
Kooyman, Gerald L.	Professor-in-Residence Emeritus	SIO	SIO
Kosmatka, John B.	Professor	SE	Warren
Kousser, Thaddeus B.	Assistant Professor	Political Science	Muir
Krasheninnikov, Sergei	Professor	MAE	Muir
Krause, Lawrence B.	Professor Emeritus	IRPS	IRPS/Roosevelt
Krauss, Ellis S.	Professor	IRPS	IRPS
Kraut, Joseph	Professor Emeritus	Chemistry and Biochemistry	Revelle
Kreutz-Delgado, Kenneth	Professor	ECE	Warren
Kriegman, David	Professor	CSE	Warren
Kripke, Daniel F.	Professor-in-Residence	Psychiatry	SchMed
Kristan, William B., Jr.	Professor	Biological Sciences—Neurobiology	Marshall
Kroll, Norman M.	Professor Emeritus	Physics	Revelle
Kronick, Richard G.	Professor	Family and Preventive Medicine	SchMed
Krueger, Ingolf	Assistant Professor	CSE	Warren
Krstic, Miroslav	Professor	MAE	Muir
Kruger, Barbara	Professor	Visual Arts	Sixth
Krysl, Petr	Assistant Professor	SE	Muir
Ku, Walter H.	Professor	ECE	Revelle
Kube, Paul R.	Lecturer (SOE)	CSE	Sixth
Kubiak, Clifford P.	Professor	Chemistry and Biochemistry	Warren
Kuczenski, Ronald T.	Professor-in-Residence	Psychiatry	SchMed
Kulik, James A.	Professor	Psychology	Warren
Kummel, Andrew C.	Professor	Chemistry and Biochemistry	Muir
Kuperman, William A.	Professor	SIO	SIO
Kuroda, Sige-Yuki	Professor Emeritus	Linguistics	Muir
Kutas, Marta	Professor	Cognitive Science	Muir
Kuti, Julius G.	Professor	Physics	Marshall
Kyte, Jack E.	Professor Emeritus	Chemistry and Biochemistry	Warren
Lake, David A.	Professor	Political Science	Marshall
Lakoff, Andrew	Assistant Professor	Sociology	Warren
Lakoff, Sanford A.	Professor Emeritus	Political Science	Warren
Lal, Devendra	Professor	SIO	SIO
Lampert, Lisa	Assistant Professor	Literature	Revelle
Lampland, Martha	Associate Professor	Sociology	Roosevelt
Lande, Russell S.	Professor	Biological Sciences—Ecology, Behavior, and Evolution	Roosevelt
Landry, Michael R.	Professor	SIO/IOD	SIO
Lane, Thomas A.	Professor	Pathology	SchMed
Langacker, Ronald W.	Professor Emeritus	Linguistics	Revelle
Langdon, Margaret H.	Professor Emeritus	Linguistics	Warren
Lanza di Scalea, Francesco	Associate Professor	MAE	Roosevelt
Larson, Lawrence	Professor	ECE	Roosevelt
Larson, Philip C.	Professor	Music	Roosevelt
Lasheras, Juan C.	Professor	MAE	Marshall
Lau, Silvanus S.	Professor	ECE	Muir
Lawder, Standish D.	Associate Professor Emeritus	Visual Arts	Warren
Lax, Jeffrey R.	Assistant Professor	Political Science	Revelle
Lee, Edward N.	Professor Emeritus	Philosophy	Revelle

Lee, Jin-Kyung	Assistant Professor	Literature	Warren
Lee, Kang	Associate Professor	Psychology	Sixth
Lee, Sing H.	Professor	ECE	Muir
Leffert, Hyam L.	Professor	Pharmacology	SchMed
Lehmann, Bruce N.	Professor	IRPS	IRPS
Leichter, James	Assistant Professor	SIO/MLRG/CCS	SIO
Levin, James A.	Professor	TEP	Warren
Levin, Lisa	Professor	SIO	SIO
Levin, Paula	Senior Lecturer (SOE)	Teacher Education Program	Marshall
Levine, Fred	Associate Professor-in-Residence	Pediatrics	SchMed
Levine, Herbert	Professor	Physics	Marshall
Levy, Robert I.	Professor Emeritus	Anthropology	Muir
Levy, Thomas E.	Professor	Anthropology	Revelle
Lewak, George J.	Associate Professor Emeritus	ECE	Muir
Lewin, Ralph A.	Professor Emeritus	SIO	SIO
Libby, Paul A.	Professor Emeritus	MAE	Revelle
Lieber, Richard L.	Professor	Orthopaedics	SchMed
Liebermann, Leonard N.	Professor Emeritus	Physics	Revelle
Lijphart, Arend	Professor Emeritus	Political Science	Revelle
Lin, Bill	Associate Professor	ECE	Roosevelt
Lin, James P.	Professor	Mathematics	Muir
Lin, Shao-Chi	Professor Emeritus	MAE	Revelle
Lindblad, Hans	Professor	Mathematics	Roosevelt
Linden, Paul F.	Professor	MAE	Muir
Lindenberg, Katja	Professor	Chemistry and Biochemistry	Marshall
Lindsley, Dan L.	Professor Emeritus	Biological Sciences—Cell and Developmental Biology	Revelle/SchMed
Linton, April	Assistant Professor	Sociology	Warren
Livingston, Robert B.	Professor Emeritus	Neurosciences	SchMed
Llewellyn Smith, Stefan G.	Assistant Professor	MAE	Warren
Lo, Yu-Hwa	Professor	ECE	Marshall
Lonidier, Fred S.	Professor	Visual Arts	Revelle
Lonsdale, Peter F.	Professor	SIO	SIO
Loomis, William F., Jr.	Professor	Biological Sciences—Cell and Developmental Biology	Revelle
Lovberg, Ralph H.	Professor Emeritus	Physics	Revelle
Lowe, Lisa M.	Professor	Literature	Muir
Lu, Weijing	Assistant Professor	History	Warren
Luco, J. Enrique	Professor/Associate Dean	MAE/School of Engineering	Marshall
Luft, David S.	Professor	History	Revelle
Lugannani, Robert	Professor	ECE	Warren
Luo, Huey-Lin	Professor	ECE	Muir
Lyon, James K.	Professor Emeritus	Literature	Roosevelt
Lytle, Cecil W.	Professor/Provost	Music/Marshall	Marshall
Macagno, Eduardo R.	Professor/Dean	Biological Sciences—Cell and Developmental Biology	Sixth
MacConnel, Kim R.	Professor	Visual Arts	Marshall
Macdougall, J. Douglas	Professor	SIO	Revelle/SIO
MacFarlane, David B.	Professor	Physics	Marshall
Machina, Mark J.	Professor	Economics	Revelle
MacLeod, Carol L.	Professor-in-Residence	Medicine	SchMed
MacLeod, Donald I.A.	Professor	Psychology	Muir
Madsen, Richard P.	Professor	Sociology	Roosevelt
Magagna, Victor V.	Associate Professor	Political Science	Muir

Magde, Douglas	Professor	Chemistry and Biochemistry	Warren
Malesky, Edward	Acting Assistant Professor	IRPS	IRPS
Malhotra, Vivek	Professor	Biological Sciences—Cell and Developmental Biology	Revelle
Manaster, Alfred B.	Professor Emeritus	Mathematics	Revelle
Mandler, George	Professor Emeritus	Psychology	Muir
Mandler, Jean M.	Professor	Cognitive Science	Revelle
Mangolte, Babette M.	Professor	Visual Arts	Marshall
Manohar, Aneesh V.	Professor	Physics	Marshall
Manovich, Lev	Associate Professor	Visual Arts	Revelle
Maple, M. Brian	Professor	Physics	Revelle
Marchetti, Karen E.	Assistant Professor	Biological Sciences—Ecology, Behavior, and Evolution	Revelle
Mares, David R.	Professor	Political Science	Muir
Marino, John A.	Associate Professor	History	Revelle
Mariscal, George L.	Associate Professor	Literature	Warren
Markenscoff, Xanthippe	Professor	MAE	Revelle
Marquardt, Diana L.	Associate Professor-in-Residence	Medicine	SchMed
Marshall, Margaret C.	Senior Lecturer (SOE)	Theatre and Dance	Marshall
Marth, Jamey D.	Professor	CMM	SchMed
Marti, Kurt	Professor Emeritus	Chemistry and Biochemistry	Revelle
Martin, Isaac	Assistant Professor	Sociology	Warren
Martin, Paul T.	Assistant Professor	Neurosciences	SchMed
Martin, Wayne M.	Associate Professor	Philosophy	Muir
Marzullo, Keith	Professor	CSE	Marshall
Masek, George E.	Professor Emeritus	Physics	Revelle
Masliah, Eliezer	Professor	Neurosciences/Pathology	SchMed
Masouredis, Serafeim P.	Professor Emeritus	Pathology	SchMed
Masry, Elias	Professor	ECE	Muir
Masters, T. Guy	Professor	SIO	SIO
Mathieu-Costello, Odile	Professor-in-Residence	Medicine	SchMed
McCammon, James Andrew	Professor	Chemistry and Biochemistry/ Pharmacology	Revelle/SchMed
McCubbins, Mathew D.	Professor	Political Science	Marshall
McCulloch, Andrew D.	Professor	Bioengineering	Muir
McDaniel, Timothy L.	Professor	Sociology	Roosevelt
McDonald, Marianne	Professor	Theatre and Dance	Revelle
McEneaney, William M.	Associate Professor	MAE/Mathematics	Warren
McGinnis, William J.	Professor	Biological Sciences—Cell and Developmental Biology	Marshall
McGowan, John A.	Professor Emeritus	SIO	SIO
McIlwain, Carl E.	Professor Emeritus	Physics	Revelle
McIntosh, Craig	Assistant Professor	IRPS	IRPS
McKenzie, Craig R.M.	Associate Professor	Psychology	Revelle
McKittrick, Joanna M.	Professor	MAE	Warren
McMorris, Trevor C.	Professor Emeritus	Chemistry and Biochemistry	Marshall
McNeal, Keith E.	Acting Assistant Professor	Anthropology	Warren
Meeker, Michael E.	Professor Emeritus	Anthropology	Revelle
Mehan, Hugh B., Jr.	Professor	Sociology	Marshall
Mellon, Pamela L.	Professor	Reproductive Medicine/Neurosciences	SchMed
Melville, W. Kendall	Professor	SIO	SIO
Mendis, D. Asoka	Professor Emeritus	ECE	Muir
Meranze, Michael	Associate Professor	History	Marshall
Metzger, Thomas A.	Professor Emeritus	History	Muir
Meyer, David A.	Professor	Mathematics	Revelle

Meyer, Karsten	Assistant Professor	Chemistry and Biochemistry	Warren
Meyer, Ursula	Senior Lecturer (SOE)	Theatre and Dance	Warren
Meyers, Marc A.	Professor	MAE	Revelle
Micciancio, Daniele	Assistant Professor	CSE	Marshall
Middleman, Stanley	Professor Emeritus	MAE	Warren
Miles, John W.	Professor Emeritus	MAE	Warren/SIO
Miller, Arnold L.	Professor Emeritus	Neurosciences	SchMed
Miller, David R.	Professor/Associate Vice Chancellor	MAE	Revelle
Miller, Stanley L.	Professor Emeritus	Chemistry and Biochemistry	Revelle
Mills, Stanley E.	Professor Emeritus	Biological Sciences—Cell and Developmental Biology	Muir
Milstein, Laurence B.	Professor	ECE	Warren
Minster, Jean-Bernard H.	Professor	SIO	SIO
Mitchell, Allan	Professor Emeritus	History	Roosevelt
Miyai, Katsumi	Professor	Pathology/Medicine	SchMed
Miyoshi, Masao	Professor	Literature	Marshall
Mizisin, Andrew P.	Professor	Pathology	SchMed
Molina, Natalia M.	Assistant Professor	Ethnic Studies	Roosevelt
Molina, Mario	Professor	Chemistry and Biochemistry	Warren/SIO
Montal, S. Mauricio	Professor	Biological Sciences—Neurobiology	Revelle
Monteón, Michael P.	Professor	History	Muir
Montrose, Louis A.	Professor	Literature	Revelle
Mookherjea, Shayan	Assistant Professor	ECE	Warren
Moore, F. Richard	Professor	Music	Revelle
Moore, James J.	Associate Professor	Anthropology	Warren
Moore, John C.	Associate Professor	Linguistics	Muir
Mosshammer, Alden A.	Professor Emeritus	History	Revelle
Muendler, Marc-Andreas	Assistant Professor	Economics	Revelle
Mukerji, Chandra	Professor	Communication/Sociology	Marshall
Munk, Walter H.	Professor Emeritus	SIO	SIO/Warren
Murakami, Hidenori	Professor	MAE	Revelle
Murphy, Thomas W., Jr.	Assistant Professor	Physics	Warren
Murre, Cornelis	Professor	Biological Sciences—Molecular Biology	Revelle
Myers, Eugene	Professor	CSE	Roosevelt
Myles, Eileen	Professor	Literature	Marshall
Myers, Robert R.	Professor	Anesthesiology/Pathology	SchMed
Nachbar, William	Professor Emeritus	MAE	Revelle
Najmabadi, Farrokh	Professor	ECE	Roosevelt
Naughton, Barry J.	Professor	IRPS	IRPS
Nee, Thomas B.	Professor Emeritus	Music	Warren
Neff, Gina	Acting Assistant Professor	Communication	Warren
Négyesy, János	Professor	Music	Muir
Nelkin, Dana	Assistant Professor	Philosophy	Roosevelt
Nemat-Nasser, Siavouche	Professor	MAE	Revelle
Nesbitt, Muriel N.	Lecturer (SOE)	Biological Sciences—Neurobiology	SchMed/Warren
Nesterenko, Vitali	Professor	MAE	Roosevelt
Newman, William A.	Professor	SIO	SIO
Newmark, Leonard D.	Professor Emeritus	Linguistics	Revelle
Newport, John W.	Professor	Biological Sciences—Cell and Developmental Biology	Muir
Newsome, Elizabeth	Associate Professor	Visual Arts	Revelle
Newton, Alexandra	Professor	Pharmacology	SchMed
Ng, Kwai	Acting Assistant Professor	Sociology	Warren

Nguyen, Truong	Professor	ECE	Marshall
Nguyen-Huu, Xuong	Professor Emeritus	Biological Sciences—Molecular Biology/ Chemistry and Biochemistry/Physics	Revelle/SchMed
Ni, Lei	Assistant Professor	Mathematics	Sixth
Nicolaides, Becky M.	Associate Professor	History	Marshall
Nicolaou, Kyriacos C.	Professor	Chemistry and Biochemistry	Muir
Nieh, James C.	Assistant Professor	Biological Sciences—Ecology, Behavior, and Evolution	Marshall
Niiler, Pearn P.	Professor	SIO	SIO
Niwa, Maho	Assistant Professor	Biological Sciences—Molecular Biology	Roosevelt
Nodelman, Sheldon A.	Professor	Visual Arts	Warren
Noel, Michael	Assistant Professor	Economics	Marshall
Nomura, Keiko	Associate Professor	MAE	Marshall
Norman, Donald A.	Professor Emeritus	Cognitive Science/Psychology	Revelle
Norman, Michael L.	Professor	Physics	Marshall
Norris, Joel R.	Assistant Professor	SIO/CAS	SIO
Norris, Richard D.	Professor	SIO/GRD	SIO
Northcutt, R. Glenn	Professor	Neurosciences	SchMed/SIO
Nuñez, Rafael	Assistant Professor	Cognitive Science	Muir
Oates, Charles	Senior Lecturer (SOE)	Theatre and Dance	Revelle
O'Brien, William A.	Associate Professor	Literature	Muir
O'Connor, Daniel T.	Professor	Medicine	SchMed
O'Connor, Joseph M.	Professor	Chemistry and Biochemistry	Marshall
Oesterreicher, Hans K.	Professor	Chemistry and Biochemistry	Muir
Ogdon, Wilbur L.	Professor Emeritus	Music	Muir
Ohman, Mark D.	Professor	SIO	SIO
Okamura, Melvin Y.	Professor	Physics	Revelle
Okikiolu, Kate	Associate Professor	Mathematics	Revelle
Olafson, Frederick A.	Professor Emeritus	Philosophy	Revelle
Olefsky, Jerrold M.	Professor	Medicine	SchMed
Olfe, Daniel B.	Professor Emeritus	MAE	Revelle
O'Neil, Thomas M.	Professor	Physics	Warren
Onuchic, José N.	Professor	Physics	Muir
Opella, Stanley J.	Professor	Chemistry and Biochemistry	Muir
O'Quigley, John	Professor	Mathematics	Muir
Orailoglu, Alex	Professor	CSE	Revelle
Orcutt, John A.	Professor	SIO	SIO
Oreskes, Naomi	Associate Professor	History	Warren
Orlitsky, Alon	Professor	ECE	Marshall
Orloff, Marshall J.	Professor	Surgery	SchMed/Muir
Ortiz, Ruben	Associate Professor	Visual Arts	Roosevelt
Oxman, Michael N.	Professor	Medicine/Pathology	SchMed
Ozyurek, Esra	Assistant Professor	Anthropology	Roosevelt
Paar, Hans P.	Professor	Physics	Roosevelt
Padden, Carol A.	Professor	Communication	Marshall
Padoan, Paolo	Assistant Professor	Physics	Warren
Palade, George	Professor-in-Residence Emeritus	CMM	SchMed
Palenik, Brian	Associate Professor	SIO	SIO
Palsson, Bernhard O.	Professor	Bioengineering	Warren
Papakonstantinou, Yannis	Associate Professor	CSE	Roosevelt
Papen, George	Professor	ECE	Sixth
Parish, Steven	Associate Professor	Anthropology	Roosevelt

Parker, Robert L.	Professor	SIO	SIO
Park, Lisa	Assistant Professor	Ethnic Studies	Muir
Parra, Max	Associate Professor	Literature	Marshall
Parrish, Michael E.	Professor	History	Muir
Parry, Chris N.	Professor	Theatre and Dance	Roosevelt
Pashler, Harold E.	Professor	Psychology	Muir
Pasler, Jann C.	Professor	Music	Roosevelt
Pasquale, Joseph C.	Professor	CSE	Marshall
Pasquinelli, Amy	Assistant Professor	Biological Sciences—Molecular Biology	Marshall
Pastor, Jennifer	Associate Professor	Visual Arts	Sixth
Patterson, Patricia A.	Professor Emeritus	Visual Arts	Muir
Paturi, Ramamohan	Professor	CSE	Warren
Pearce, Roy Harvey	Professor Emeritus	Literature	Roosevelt
Pellow, David	Associate Professor	Ethnic Studies	Muir
Penn, Nolan E.	Professor Emeritus	Psychiatry	SchMed
Penner, Stanford S.	Professor Emeritus	MAE	Revelle
Perlmutter, David M.	Professor	Linguistics	Revelle
Perrin, Charles L.	Professor	Chemistry and Biochemistry	Revelle
Peterson, Laurence E.	Professor Emeritus	Physics	Revelle
Petrovich, Victoria	Assistant Professor	Theatre and Dance	Roosevelt
Pevzner, Pavel A.	Professor	CSE	Marshall
Phillips, David P.	Professor	Sociology	Revelle
Pickowicz, Paul G.	Professor	History	Muir
Pillus, Lorraine	Professor	Biological Sciences—Molecular Biology	Revelle
Pilz, Renate B.	Associate Professor-in-Residence	Medicine	SchMed
Piñeda, Jaime A.	Associate Professor	Cognitive Science	Roosevelt
Pinkel, Robert	Professor	SIO	SIO
Piñon, Ramón, Jr.	Associate Professor Emeritus	Biology	Marshall
Plant, Rebecca	Assistant Professor	History	Muir
Plantamura, Carol	Professor	Music	Revelle
Pogliano, Joseph	Assistant Professor	Biological Sciences—Molecular Biology	Warren
Pogliano, Kit	Associate Professor	Biological Sciences—Cell and Molecular Biology	Roosevelt
Polinsky, Maria	Professor	Linguistics	Revelle
Politis, Dimitris	Professor	Mathematics	Roosevelt
Pomeroy, Earl	Professor Emeritus	History	Warren
Popescu, Cristian	Assistant Professor	Mathematics	Revelle
Popkin, Samuel L.	Professor	Political Science	Marshall
Posakony, James W.	Professor	Biological Sciences—Neurobiology	Marshall
Postero, Nancy G.	Assistant Professor	Anthropology	Roosevelt
Powell, Frank L., Jr.	Professor	Medicine	SchMed
Powell, Henry C.	Professor	Pathology	SchMed
Pozrikidis, Constantine	Professor	MAE	Muir
Prather, Kimberly A.	Professor	Chemistry and Biochemistry/SIO	Muir/SIO
Price, Paul A.	Professor	Biological Sciences—Molecular Biology	Muir
Priestley, M. J. Nigel	Professor Emeritus	SE	Warren
Printz, Morton P.	Professor	Pharmacology	SchMed
Propp, William H.	Professor	History	Muir
Puckette, Miller S.	Professor	Music	Warren
Quest, Kevin B.	Professor	ECE	Warren
Radic, Stojan	Associate Professor	ECE	Revelle
Rabin, Jeffrey M.	Professor	Mathematics	Revelle
Radcliff, Pamela B.	Associate Professor	History	Roosevelt

Ramachandran, Vilayanur S.	Professor	Psychology	Marshall
Ramanathan, Ramachandra	Professor Emeritus	Economics	Revelle
Ramanathan, Veerabhadran	Professor	SIO	SIO
Ramey, Garey	Professor	Economics	Warren
Ramey, Valerie A.	Professor	Economics	Marshall
Ramsey, Claire	Assistant Professor	TEP	Muir
Randel, Fred V.	Associate Professor	Literature	Revelle
Rangan, Venkat P.	Professor	CSE	Revelle
Rao, Bhaskar D.	Professor	ECE	Revelle
Rao, Ramesh	Professor	ECE	Revelle
Rapaport, Samuel I.	Professor Emeritus	Medicine/Pathology	SchMed
Rauch, James E.	Professor	Economics	Marshall
Rayo, Agustin	Assistant Professor	Philosophy	Revelle
Rearden, C. Anne	Professor	Pathology	SchMed
Reid, Joseph L.	Professor Emeritus	SIO	SIO
Reid, Roddey	Associate Professor	Literature	Muir
Reinagal, Pamela	Assistant Professor	Biological Sciences—Neurobiology	Warren
Remmel, Jeffrey D.	Professor	Mathematics	Muir
Restrepo, José	Associate Professsor	SE	Revelle
Reynolds, Edward	Professor Emeritus	History	Marshall
Reynolds, Roger L.	Professor	Music	Muir
Rheingold, Arnold L.	Professor	Chemistry and Biochemistry	Marshall
Rhodes, Jane	Associate Professor	Ethnic Studies	Marshall
Richman, Douglas D.	Professor-in-Residence	Pathology/Medicine	SchMed
Rickard, Timothy	Associate Professor	Psychology	Roosevelt
Rickert, Robert	Assistant Professor	Biological Sciences—Molecular Biology	Revelle
Rickett, Barnaby J.	Professor	ECE	Muir
Rickless, Samuel C.	Associate Professor	Philosophy	Roosevelt
Ride, Sally K.	Professor	Physics	Marshall
Rincón, Patricia A.	Senior Lecturer (SOE)	Theatre and Dance	Roosevelt
Ringgold, Faith	Professor Emeritus	Visual Arts	Muir
Ringrose, David R.	Professor	History	Revelle
Rinott, Yosef	Professor Emeritus	Mathematics	Revelle
Robbins, Joel	Associate Professor	Anthropology	Marshall
Robbins, Paul E.	Assistant Professor	SIO/PORD	SIO
Roberts, Justin D.	Associate Professor	Mathematics	Warren
Rodin, Burton	Professor Emeritus	Mathematics	Muir
Roeder, Philip G.	Associate Professor	Political Science	Marshall
Roemmich, Dean H.	Professor	SIO	SIO
Rohrl, Helmut	Professor Emeritus	Mathematics	Revelle
Rona-Tas, Akos	Associate Professor	Sociology	Roosevelt
Rose, Sharon	Associate Professor	Linguistics	Roosevelt
Rosenblatt, Murray	Professor Emeritus	Mathematics	Muir
Rosenblatt, Richard H.	Professor Emeritus	SIO	SIO
Rosenfeld, Michael Geoff	Professor	Medicine	SchMed
Ross, Lola R.	Professor	Family and Preventive Medicine	SchMed/Muir
Rotenberg, Manuel	Professor Emeritus	ECE	Muir
Rothenberg, Jerome D.	Professor Emeritus	Literature/Visual Arts	Roosevelt
Rothschild, Linda P.	Professor	Mathematics	Warren
Rouse, John	Associate Professor	Theatre and Dance	Roosevelt
Roy, Kaustuv	Associate Professor	Biological Sciences—Ecology, Behavior, and Evolution	Roosevelt
Rudee, M. Lea	Professor Emeritus	ECE	Warren

Rudnick, Daniel L.	Professor	SIO	SIO
Rudwick, Martin J.S.	Professor Emeritus	History	Warren
Ruiz, Ramón E.	Professor Emeritus	History	Muir
Rumsey, Victor H.	Professor Emeritus	ECE	Muir
Russell, Lynn	Associate Professor	SIO/CAS	SIO
Russell, Percy J.	Associate Professor Emeritus	Biology	SchMed
Rutherford, Donald P.	Professor	Philosophy	Revelle
Sah, Robert L.Y.	Professor	Bioengineering	Muir
Saier, Milton H., Jr.	Professor	Biological Sciences—Molecular Biology	Muir
Sailor, Dylan	Assistant Professor	Literature	Revelle
Sailor, Michael J.	Professor	Chemistry and Biochemistry	Revelle
Sala, Enric	Assistant Professor	SIO/MLRG	SIO
Salmon, David P.	Professor-in-Residence	Neurosciences	SchMed
Salmon, Richard L.	Professor	SIO	SIO
Samphantharak, Krislert	Assistant Professor	IRPS	IRPS
Sánchez, Lisa	Assistant Professor	Ethnic Studies	Muir
Sánchez, Marta E.	Professor	Literature	Marshall
Sánchez, Rosaura	Professor	Literature	Marshall
Sandwell, David T.	Professor	SIO	SIO
Sarkar, Sutanu	Professor	MAE	Warren
Savage, Stefan	Assistant Professor	CSE	Marshall
Saville, Jonathan	Associate Professor Emeritus	Theatre and Dance	Revelle
Savitch, Walter J.	Professor Emeritus	CSE	Muir
Sawrey, Barbara	Senior Lecturer (SOE)	Chemistry and Biochemistry	Revelle
Scanziani, Massimo	Assistant Professor	Biological Sciences—Neurobiology	Sixth
Schaede, Ulrike	Associate Professor	IRPS	IRPS
Schafer, William	Associate Professor	Biological Sciences—Neurobiology	Roosevelt
Schane, Sanford A.	Professor Emeritus	Linguistics	Roosevelt
Scheffler, Immo E.	Professor	Biological Sciences—Molecular Biology	Revelle
Schick, Steven E.	Professor	Music	Muir
Schlenker, Wolfram	Assistant Professor	Economics	Muir
Schmid-Schoenbein, Geert W.	Professor	Bioengineering	SchMed
Schmidt, Robert J.	Professor	Biological Sciences—Cell and Developmental Biology	Warren
Schneider, Alan M.	Professor Emeritus	MAE	Warren
Schneider, Jerry A.	Professor/Dean	Pediatrics/Academic Affairs	SchMed
Schoeninger, Margaret J.	Professor	Anthropology	Marshall
Schrauzer, Gerhard N.	Professor Emeritus	Chemistry and Biochemistry	Revelle
Schreibman, Laura E.	Professor/Associate Chancellor	Psychology	Warren
Schroeder, Julian I.	Professor	Biological Sciences—Cell and Developmental Biology	Warren
Schuckit, Marc A.	Professor	Psychiatry	SchMed
Schudson, Michael S.	Professor	Communication	Marshall
Schuller, Ivan K.	Professor	Physics	Revelle
Schurgers, Curt	Assistant Professor	ECE	Sixth
Schultz, Sheldon	Professor Emeritus	Physics	Marshall
Schwartz, Theodore	Professor Emeritus	Anthropology	Muir
Schweinsburg, Jason R.	Assistant Professor	Mathematics	Roosevelt
Sclater, John G.	Professor	SIO	SIO
Scull, Andrew T.	Professor	Sociology	Roosevelt
Sebald, Anthony V.	Associate Professor	ECE	Marshall
Segal, David S.	Professor	Psychiatry	SchMed

Seible, Frieder	Professor	MAE	Marshall
Sejnowski, Terrence J.	Professor	Biological Sciences—Neurobiology	Muir
Selverston, Allen I.	Professor Emeritus	Biological Sciences—Neurobiology	Warren
Semendeferi, Katerina	Assistant Professor	Anthropology	Marshall
Send, Uwe	Professor	SIO/PORD	SIO
Sereno, Martin I.	Professor	Cognitive Science	Warren
Seshadri, Kalyanasundaram	Professor	MAE	Marshall
Severinghaus, Jeffrey	Associate Professor	SIO	SIO
Shadwick, Robert E.	Professor	SIO	SIO
Shafir, Gershon	Professor	Sociology	Roosevelt
Shah, Nayan B.	Associate Professor	History	Warren
Sham, Lu Jeu	Professor	Physics	Warren
Shank, Adele E.	Professor	Theatre and Dance	Marshall
Shank, Theodore J.	Professor Emeritus	Theatre and Dance	Revelle
Shapiro, Vitali	Professor	ECE/Physics	Roosevelt
Sharma, Vivek A.	Professor	Physics	Muir
Sharpe, Michael J.	Professor	Mathematics	Muir
Shearer, Peter M.	Professor	SIO	SIO
Shenk, Norman Al	Lecturer (SOE)	Mathematics	Revelle
Sher, Gila	Professor	Philosophy	Warren
Shevelow, Kathryn	Associate Professor	Literature	Muir
Shirk, Susan L.	Professor	IRPS	IRPS
Shor, George G., Jr.	Professor Emeritus	SIO	SIO
Shugart, Matthew F.	Professor	IRPS	IRPS
Shuler, Kurt E.	Professor Emeritus	Chemistry and Biochemistry	Revelle
Shults, Clifford W.	Professor	Neurosciences	SchMed
Siegel, Jay S.	Professor	Chemistry and Biochemistry	Muir
Siegel, Paul	Professor	ECE	Roosevelt
Silber, John J.	Professor Emeritus	Music	Roosevelt
Silva, Denise Ferreira da	Assistant Professor	Ethnic Studies	Revelle
Silva, Ernest R.	Professor	Visual Arts	Warren
Silva, Gabriel	Assistant Professor-in-Residence	Bioengineering	Sixth
Silverman, Gregg J.	Professor-in-Residence	Medicine	SchMed
Singer, S. Jonathan	University Professor Emeritus	Biological Sciences—Cell and Developmental Biology	Revelle/SchMed
Sinha, Amitabha	Associate Professor	Chemistry and Biochemistry	Warren
Skelton, Robert E.	Professor	MAE	Roosevelt
Skrentny, John D.	Professor	Sociology	Warren
Slantchev, Branislav L.	Assistant Professor	Political Science	Roosevelt
Small, Lance W.	Professor	Mathematics	Revelle
Smallwood, Dennis E.	Associate Professor Emeritus	Economics	Warren
Smallwood, Stephanie E.	Assistant Professor	History	Muir
Smarr, Janet	Professor	Theatre and Dance	Revelle
Smarr, Larry	Professor	CSE	Roosevelt
Smith, Donald R.	Professor Emeritus	Mathematics	Revelle
Smith, Douglas E.	Assistant Professor	Physics	Roosevelt
Smith, Douglas W.	Professor Emeritus	Biological Sciences—Molecular Biology	Muir
Smith, Harding E.	Professor	Physics	Revelle
Smith, Laurie G.	Associate Professor	Biological Sciences—Cell and Developmental Biology	Roosevelt
Smith, Peter H.	Professor	Political Science	Marshall
Smith, Susan L.	Associate Professor	Visual Arts	Muir
Snaith, Yolande	Professor	Theatre and Dance	Muir
Snoeren, Alex	Assistant Professor	CSE	Roosevelt

Sobel, Joel	Professor	Economics	Revelle
Solis, Faustina	Professor Emeritus	Family and Preventive Medicine	Marshall
Sollberger, Harvey	Professor	Music	Muir
Somero, George N.	Professor Emeritus	SIO	SIO
Somerville, Richard C. J.	Professor	SIO	SIO
Song, Bang-Sup	Professor	ECE	Warren
Sorensen, Harold W.	Professor Emeritus	MAE	Revelle
Souviney, Randall J.	Senior Lecturer (SOE)	TEP	Marshall
Spector, Deborah H.	Professor	Biological Sciences—Molecular Biology	SchMed/Roosevelt
Spector, Stephen A.	Professor	Pediatrics	SchMed
Spiess, Fred N.	Professor Emeritus	SIO	SIO
Spiro, Melford E.	Professor Emeritus	Anthropology	Muir
Spitzer, Nicholas C.	Professor	Biological Sciences—Neurobiology	Muir
Squire, Larry R.	Professor-in-Residence	Psychiatry/Neurosciences/Psychology	SchMed/Warren
Stalbaum, Brett	Lecturer (PSOE)	Visual Arts	Sixth
Stammer, Detlef B.	Associate Professor	SIO	SIO
Star, Susan Leigh	Professor	Communication	Revelle
Stark, Harold M.	Professor	Mathematics	Muir
Starr, Ross M.	Professor	Economics	Warren
Steiger, Rand	Professor	Music	Warren
Steinbach, Hyam	Professor	Visual Arts	Muir
Steinberg, Daniel	Professor Emeritus	Medicine	SchMed
Steinmetz, Phel	Associate Professor	Visual Arts	Revelle
Stern, Lesley	Professor	Visual Arts	Sixth
Stevens, Jane	Associate Professor	Music	Revelle
Stewart, John L.	Professor Emeritus	Literature	Muir
Stiles, Joan	Professor	Cognitive Science	Muir
St. Louis, Brett	Assistant Professor	Ethnic Studies	Warren
Storms, Lowell H.	Professor-in-Residence Emeritus	Psychiatry	SchMed
Stramski, Dariusz	Professor	SIO	SIO
Streeby, Shelley	Associate Professor	Literature	Roosevelt
Stroll, Avrum	Professor Emeritus	Philosophy	Revelle
Strom, Kaare	Professor	Political Science	Roosevelt
Strong, Tracy B.	Professor	Political Science	Roosevelt
Strum, Shirley C.	Professor	Anthropology	Revelle
Subramani, Suresh	Professor	Biological Sciences—Molecular Biology	Warren
Subramaniam, Shankar	Professor	Bioengineering	Roosevelt
Sugihara, George	Professor	SIO	SIO
Suhl, Harry	Professor Emeritus	Physics	Revelle
Sullivan, Robert S.	Professor/Dean	Rady School of Management	RadySchMgmt
Sun, Yixiao	Assistant Professor	Economics	Roosevelt
Sung, Lanping Amy	Associate Professor	Bioengineering	Warren
Surko, Clifford M.	Professor	Physics	Marshall
Swanson, Robert A.	Professor Emeritus	Physics	Revelle
Swartz, Marc J.	Professor	Anthropology	Muir
Swerdlow, Neal R.	Professor	Psychiatry	SchMed
Swinney, David A.	Professor	Psychology	Roosevelt
Sworder, David D.	Professor/Associate Dean	ECE/Graduate Studies & Research	Revelle
Talbot, Jan B.	Professor	MAE	Muir
Talke, Frank E.	Professor	MAE	Warren
Talley, Lynne D.	Professor	SIO	SIO
Tanaka, Stefan	Associate Professor	History	Roosevelt
Tarin, David	Professor	Pathology	SchMed

Taur, Yuan	Professor	ECE	Warren
Tauxe, Lisa	Professor	SIO	SIO
Tay, William Shu-Sam	Professor Emeritus	Literature	Roosevelt
Taylor, Palmer W.	Professor	Pharmacology	SchMed/SPPS
Taylor, Susan S.	Professor	Chemistry and Biochemistry/Pharmacology	Roosevelt/SchMed
Teichner, Peter	Professor	Mathematics	Roosevelt
Tejada, Roberto	Assistant Professor	Visual Arts	Marshall
Terras, Audrey A.	Professor	Mathematics	Revelle
Terry, Robert D.	Professor Emeritus	Neurosciences/Pathology	SchMed
Tesler, Glenn P.	Assistant Professor	Mathematics	Warren
Thal, Leon J.	Professor	Neurosciences	SchMed
Theodorakis, Emmanouil	Associate Professor	Chemistry and Biochemistry	Muir
Thiemens, Mark H.	Professor/Dean	Chemistry and Biochemistry/ Physical Sciences	Marshall
Thiess, Frank B.	Senior Lecturer (SOE) Emeritus	Mathematics	Marshall
Ticho, Harold K.	Professor Emeritus/Vice Chancellor Emeritus	Physics/Academic Affairs	Marshall
Timmer, C. Peter	Professor	IRPS	IRPS
Timmerman, Allan	Professor	Economics	Muir
Todd, Michael	Assistant Professor	SE	Muir
Todorov, Emanuel	Assistant Professor	Cognitive Science	Roosevelt
Tohsaku, Yasu-Hiko	Professor	IRPS	IRPS/Roosevelt
Tokuyasu, Kiyoteru	Professor-in-Residence Emeritus	Biological Sciences—Cell and Developmental Biology	Revelle
Tomlinson, Barbara	Associate Professor	Literature	Muir
Tonkovich, Nicole	Associate Professor	Literature	Roosevelt
Tor, Yitzhak	Professor	Chemistry and Biochemistry	Marshall
Trauner, Doris A.	Professor	Neurosciences/Pediatrics	SchMed
Triesch, Jochen	Assistant Professor	Cognitive Science	Revelle
Trivedi, Mohan	Professor	ECE	Warren
Trogler, William C.	Professor	Chemistry and Biochemistry	Revelle
Troupe, Quincy	Professor Emeritus	Literature	Marshall
Truant, Cynthia M.	Associate Professor	History	Roosevelt
Tsien, Roger K.	Professor	Pharmacology/Chemistry and Biochemistry	SchMed/Revelle
Tu, Charles W.	Professor	ECE	Marshall
Tuan, Yuan	Professor	ECE	Warren
Tukey, Robert H.	Professor	Pharmacology/Chemistry and Biochemistry	SchMed/Marshall
Tullsen, Dean	Associate Professor	CSE	Warren
Turetzky, Bertram J.	Professor Emeritus	Music	Muir
Turner, Christena L.	Associate Professor	Sociology	Roosevelt
Tuzin, Donald F.	Professor	Anthropology	Revelle
Tynan, George	Associate Professor	MAE	Muir
Tytler, David R.	Professor	Physics	Muir
Uang, Chia-Ming	Professor	SE	Warren
Ung, Chinary	Professor	Music	Roosevelt
Vacquier, Victor	Professor Emeritus	SIO	SIO
Vacquier, Victor D.	Professor	SIO	SIO
Vahdat, Amin	Associate Professor	CSE	Revelle
Van der Geer, Peter	Assistant Professor	Chemistry and Biochemistry	Roosevelt
Van Nieuwenhze, Michael	Assistant Professor	Chemistry and Biochemistry	Revelle
Van Young, Eric	Professor	History	Roosevelt
Vardy, Alexander	Professor	ECE/CSE	Warren

Varghese, George	Professor	CSE	Muir
Varki, Ajit P.	Professor	Medicine/CMM	SchMed
Varni, James W.	Professor-in-Residence	Psychiatry	SchMed
Varon, Silvio S.	Professor Emeritus	Biological Sciences—Neurobiology	SchMed
Vasconcellos, Nuno	Assistant Professor	ECE	Roosevelt
Vasquez, Olga A.	Associate Professor	Communication	Marshall
Vecchio, Kenneth S.	Professor	MAE	Roosevelt
Vehrencamp, Sandra L.	Professor Emeritus	Biological Sciences—Ecology, Behavior, and Evolution	Muir
Verdicchio, Pasquale	Associate Professor	Literature	Roosevelt
Vernon, Wayne	Professor Emeritus	Physics	Revelle
Vianu, Victor D.	Professor	CSE	Marshall
Vickers, Daniel F.	Professor	History	Muir
Vidal, Mary	Associate Professor	Visual Arts	Revelle
Vincent, Jeffrey	Professor	IRPS	IRPS
Viterbi, Andrew J.	Professor Emeritus	ECE	Warren
Voelker, Geoffrey	Assistant Professor	CSE	Muir
Vu, Van H.	Assistant Professor	Mathematics	Roosevelt
Wadsworth, Adrian R.	Professor	Mathematics	Warren
Wagner, Arthur	Professor Emeritus	Theatre and Dance	Muir
Wagner, Peter D.	Professor	Medicine	SchMed
Wahlen, Martin	Professor	SIO	SIO
Waisman, Carlos H.	Professor	Sociology	Marshall
Walk, Cynthia	Associate Professor	Literature	Roosevelt
Wallach, Nolan R.	Professor	Mathematics	Roosevelt
Wallack, Jessica	Acting Assistant Professor	IRPS	IRPS
Walter, Barbara F.	Associate Professor	IRPS	IRPS
Walter, Gernot F.	Professor	Pathology	SchMed
Wang, Deli	Assistant Professor	ECE	Roosevelt
Wang, Jean Yin Jen	Professor	Biological Sciences—Molecular Biology	SchMed/Roosevelt
Wang, Jing	Acting Assistant Professor	Biological Sciences—Neurobiology	
Wang, Wei	Assistant Professor	Chemistry and Biochemistry	Sixth
Ward, John F.	Professor Emeritus	Radiology	SchMed
Wasserman, Stephen I.	Professor	Medicine	SchMed
Wasserman, Steven A.	Professor	Biological Sciences—Cell and Molecular Biology	Warren
Waters, Les	Professor	Theatre and Dance	Revelle
Watkins, Eric	Associate Professor	Philosophy	Revelle
Watson, Joel	Professor	Economics	Muir
Watson, Joseph W.	Professor/Vice Chancellor	Chemistry and Biochemistry/Student Affairs	Marshall
Watson, Kenneth M.	Professor Emeritus	SIO	SIO
Wavrik, John J.	Associate Professor	Mathematics	Muir
Wayne, Don E.	Associate Professor	Literature	Muir
Weare, John H.	Professor	Chemistry and Biochemistry	Revelle
Webster, Nicholas J. G.	Associate Professor-in-Residence	Medicine	SchMed
Weiss, Ray F.	Professor/Associate Dean	SIO	SIO
Welchman, John C.	Professor	Visual Arts	Muir
Wenkert, Ernest	Professor Emeritus	Chemistry and Biochemistry	Revelle
Wenzl, Hans G.	Professor	Mathematics	Marshall
Werner, Bradley T.	Professor	SIO	SIO
Wesling, Donald T.	Professor	Literature	Roosevelt
West, John B.	Professor	Medicine	SchMed

Westman, Robert S.	Professor	History	Muir
Wheeler, John C.	Professor	Chemistry and Biochemistry	Revelle
White, Fred N.	Professor Emeritus	Medicine	SchMed/SIO
White, Halbert L.	Professor	Economics	Revelle
White, Michelle J.	Professor	Economics	Roosevelt
Whitehead, Mark C.	Professor	Surgery	SchMed
Widener, Daniel	Assistant Professor	History	Sixth
Wieder, Harry H.	Professor-in-Residence Emeritus	ECE	Muir
Wienhausen, Gabriele	Senior Lecturer (SOE)/Provost	Biological Sciences—Cell and Developmental Biology/Sixth	Sixth
Williams, Ben A.	Professor	Psychology	Muir
Williams, Forman A.	Professor	MAE	Marshall
Williams, Ruth J.	Professor	Mathematics	Warren
Williamson, S. Gill	Professor Emeritus	CSE	Roosevelt
Wills, Christopher	Professor	Biological Sciences—Ecology, Behavior, and Evolution	Warren/SchMed
Winant, Clinton D.	Professor	SIO	SIO
Winker, James R.	Professor	Theatre and Dance	Marshall
Winkielman, Piotr	Associate Professor	Psychology	Revelle
Winterer, Edward L.	Professor Emeritus	SIO	SIO
Wiseman, Jacqueline P.	Professor Emeritus	Sociology	Warren
Witztum, Joseph L.	Professor	Medicine	SchMed
Wixted, John T.	Professor	Psychology	Revelle
Wolf, Jack K.	Professor	ECE	Roosevelt
Wolfe, Arthur M.	Professor	Physics	Warren
Wolynes, Peter G.	Professor	Chemistry and Biochemistry/Physics	Warren
Wong, David Y.	Professor Emeritus	Physics	Warren
Wong-Staal, Flossie	Professor Emeritus	Biological Sciences—Molecular Biology/ Medicine	Revelle/SchMed
Woodhull, Winifred	Associate Professor	Literature	Warren
Woodruff, Christopher M.	Associate Professor	IRPS	IRPS
Woodruff, David S.	Professor	Biological Sciences—Ecology, Behavior, and Evolution	Roosevelt
Woods, Virgil L.	Associate Professor	Medicine	SchMed
Woolard, Kathryn A.	Professor	Anthropology	Muir
Wright, Andrew	Professor Emeritus	Literature	Revelle
Wuerthwein, Frank	Associate Professor	Physics	Warren
Wulbert, Daniel E.	Professor	Mathematics	Marshall
Xu, Yang	Assistant Professor	Biological Sciences—Molecular Biology	Marshall
Yaffe, Michael P.	Professor	Biological Sciences—Cell and Developmen tal Biology	Marshall
Yaksh, Tony L.	Professor	Anesthesiology/Pharmacology	SchMed
Yang, Jerry C.	Assistant Professor	Chemistry and Biochemistry	Warren
Yanofsky, Martin F.	Professor	Biological Sciences—Cell and Developmental Biology	Warren
Yayanos, A. Aristides	Professor-in-Residence Emeritus	SIO	SIO
Yee, Bennet S.	Assistant Professor	CSE	Muir
Yen, Samuel S.C.	Professor Emeritus	Reproductive Medicine	SchMed
Yguerabide, Juan	Professor Emeritus	Biology	Marshall
Yip, Wai-Lim	Professor	Literature	Muir
Yoneyama, Lisa	Associate Professor	Literature	Roosevelt

York, Herbert F.	Professor Emeritus	Physics	Warren
Young, William R.	Professor	SIO	SIO
Yu, Edward T.	Professor	ECE	Marshall
Yu, Paul K. L.	Professor	ECE	Revelle
Yuasa, Joji	Professor Emeritus	Music	Warren
Yun, Kenneth Y.	Associate Professor	ECE	Revelle
Zamosc, Leon	Associate Professor	Sociology	Roosevelt
Zanetti, Maurizio	Professor-in-Residence	Medicine	SchMed
Zeger, Kenneth A.	Professor	ECE	Roosevelt
Zelmanov, Efim	Professor	Mathematics	Sixth
Zentella, Ana Celia	Professor	Ethnic Studies	Roosevelt
Zhang, Yingjin	Professor	Literature	Warren
Zhao, Yunde	Assistant Professor	Biological Sciences—Cell and Developmental Biology	Revelle
Zhiri, Oumelbanine	Professor	Literature	Roosevelt
Zhou, Huilin	Assistant Professor	Chemistry and Biochemistry	Marshall
Zilberg, Elana	Assistant Professor	Communication	Muir
Zimm, Bruno H.	Professor Emeritus	Chemistry and Biochemistry	Revelle
Zipser, David	Professor Emeritus	Cognitive Science	Roosevelt
Zisook, Sidney	Professor	Psychiatry	SchMed
Zivin, Justin A.	Professor	Neurosciences	SchMed
Zuker, Charles	Professor	Biological Sciences—Neurobiology/ Neurosciences	Revelle/SchMed

Key to Course Listings

Courses numbered 1 through 99 are lower-division courses and are normally open to freshmen and sophomores. Courses numbered 87 are Freshman Seminars.

Courses numbered 100 through 199 are upper-division courses and are ordinarily open only to students who have completed at least one lower-division course in the given subject, or six quarters of college work.

Courses numbered 200 through 299 are graduate courses and are ordinarily open only to students who have completed at least eighteen upper-division units basic to the subject matter of the course.

Courses numbered 300 through 399 are professional courses for teachers, which are specifically designed for teachers or prospective teachers.

Courses numbered 400 through 499 are other professional courses.

Sample Course Listing:

100 (see above) Title of Course (4) (number of quarter hours or units of credit)
Course Description. Prerequisites: [listed]. (F) [Quarter the course is taught].

Academic Internship Program

OFFICE: Literature Building, Second Floor, Warren College
http://provost.ucsd.edu/warren

THE PROGRAM

The Academic Internship Program (AIP) offers qualified juniors and seniors the opportunity to acquire valuable work experience related to academic and career interests. Although most internships are in the San Diego area, the Academic Internship Program is national in scope, including the popular Washington, D.C. program, and international, including the London program. Housing arrangements and orientations are parts of both programs. An extensive library lists more than 2000 available internships in varied settings including, but not limited to, TV and radio stations, law offices, medical research labs and clinics, government agencies, high-tech and biotech companies, engineering, advertising and public relations firms, and financial institutions. Students also can work with the internship office to set up their own positions.

The program operates all four quarters; students intern a minimum of ten hours per week and can earn units of upper-division credit ranging from one to twelve. Students may enroll in a maximum of four internships and/or earn sixteen units of internship credit during the course of their junior and senior years. The number of units earned corresponds to the number of hours worked, actual job description and the length of a research paper/project. The research paper/project and relevant readings comprise the academic component of the program, which is directed by a faculty adviser. selected by the student. One-unit internships require assigned faculty advisers and extended program evaluations. All students earn grades of P/NP and receive transcript notations.

The AIP serves students from all five colleges and handles all undergraduate majors. Students planning to participate in the Academic Internship Program should apply at least one quarter before they want to be enrolled in the program, or two quarters prior to a Washington, D.C. or London internship. Students planning to set up their own out-of-town internships are encouraged to apply two quarters in advance. In cooperation with AIP and UCSD's Programs Abroad Office, students also may participate in, and earn academic credit for, other established internships abroad.

To be eligible for the program, students must have completed at least ninety units of credit with some related upper-division course work and have a minimum 2.5 GPA at the date of application.

197. Academic Internship Program (1-12)
Individual placements for field learning which are integrated with academic programs will be developed and coordinated by the program. A written contract involving all parties will include learning objectives, a project outline, and means of supervision and progress evaluation, and must be received prior to the beginning of the internship. *Prerequisites: consent of instructor and submission of a written contract.*

African Studies Minor

OFFICE: 135 Social Science Building, Thurgood Marshall Campus
(858) 822-0265

PARTICIPATING FACULTY

Professors

Zeinabu Davis, M.F.A., *Communication*
Bennetta Jules-Rosette, Ph. D., *Sociology, Director*
Thomas E. Levy, Ph. D., *Anthropology*
Maria Polinsky, Ph.D., *Linguistics*
Edward Reynolds, Ph. D., *History* (Emeritus)
Marc J. Swartz, Ph. D., *Anthropology*

Associate Professors

Robert Cancel, Ph. D., *Literature*
Ivan Evans, Ph. D., *Sociology*
Clark Gibson, Ph.D., *Political Science*
Robert Horwitz, Ph. D., *Communication*
Sharon Rose, Ph.D., *Linguistics*

Assistant Professors

Boatema Boateng, Ph.D., *Communication*
Karen Ferree, Ph.D., *Political Science*

African studies is an interdisciplinary minor that covers African topics and issues through a coordinated set of courses offered in the Departments of Anthropology, Communication, Ethnic Studies, History, Literature, Music, Political Science, Sociology, Theatre and Dance, and Visual Arts. In addition to the offerings at UCSD, opportunities for further study in Africa and Europe are available through the University of California Education Abroad Program, with programs in Ghana and South Africa as well as at the National University of Côte d'Ivoire, the Université de Paris V, the Université de Bordeaux II, and study abroad programs offered through other U.S. universities. A number of African languages are available through the UCSD Department of Linguistics. Students may take independent study units and tutorials with faculty in the program to learn the languages of their respective areas of interest. In addition, students are encouraged to participate in special seminars and presentations offered annually by the African and African-American Studies Research Project. Students may take the seminars for credit by signing up for a 198/199 with a qualified African studies professor. A minor in African studies consists of seven total courses. Students may take no more than four courses in any one department. Also, a minimum of one course each from of the following three groups is required: Group A–Traditional Cultures and Premodern Africa, Group B–African Society and Politics, and Group C–African Expressive Culture.

The **African studies minor** provides students with a broad background in African history, soci-

eties, culture, and politics. Please contact Professor Bennetta Jules-Rosette in the Department of Sociology (Social Science Building, Rm. 471), (858) 534-4790 or the African Studies Office at (858) 822-0265 for more information. Quarterly course offerings are subject to change. Interested students should consult the program faculty for an up-to-date list.

COURSES

Group A: Traditional Cultures and Premodern Africa

ANRG 104. Traditional African Societies and Cultures (4)

Com/Cul 118. Oral History (4)

Ethnic Studies 142. Languages of Africa (4)

HIAF 110. History of Africa to 1880 (4)

HIAF 120. History of South Africa (4)

HIUS 135. Slavery and the Atlantic World (4)

Group B: African Society and Politics

ANGN 183. Chiefdoms, States, and the Emergence of Civilizations (4)

Com/Cul 179. Colonialism and Culture (4)

Ethnic Studies 157. Ethnic Conflict in the Third World (4)

HIAF 111. Modern Africa since 1880 (4)

HIAF 130. African Society and the Slave Trade (4)

HIAF 140. Economic History of Africa (4)

HIUS 136. Slavery and Freedom in Nineteenth-Century U.S.: Images and Realities (4)

Political Science 132A. Political Modernization Theory (4)

Political Science 135A. Ethnic Conflict in the Third World (4)

Political Science 136B. Comparative Politics and Political Culture (4)

Soc C/148C. Power, Culture, and Social Revolt (4)

Soc C/157. Religion in Contemporary Society (4)

Soc D/158. Islam in the Modern World (4)

Soc D/188A. Community and Social Change in Africa (4)

Soc D/188J. Change in Modern South Africa (4)

Group C: African Expressive Culture

Com/Cul 127. Folklore and Communication (4)

Com/Cul 146. Culture and Thought (4)

Com/Cul 179. Colonialism and Culture (4)

Ethnic Studies 176. Black Music/Black Text: Communication and Cultural Expression (4)

LTGN 130. Novel and History in the Third World (4)

LTGN 132. African Oral Literature (4)

LTGN 133. Introduction to Literature and Film of Modern Africa (4)

LTGN 185. Literature and Ideas (4)

LTGN 186A-B-C. Modernity and Literature (4-4-4)

LTEN 187. Black Music/Black Text: Communication and Cultural Expression (4)

LTEN 188. Contemporary Caribbean Literature (4)

MUS 13AF. World Music/Africa (4)

MUS 111. World Music Traditions (4)

MUS 126. Introduction to Oral Music (4)

MUS 127A-B. Music of Black Americans (4-4)

Soc A/105. Ethnographic Film and Media Methods (6)

Soc D/187. African Societies Through Film (4)

TH/HS 109. Modern Black Drama (4)

TH/HS153. Dance History-Jazz Dance & Related Ethnic Studies (4)

Visual Arts 126A. African and Afro-American Art (4)

Visual Arts 127B. Western & Non-Western Rituals & Ceremonies (4)

Visual Arts 127D. Primitivism and Exoticism in Modern Art (4)

Visual Arts 128E. Topics in Non-Western Art (4)

Anthropology

Office: Social Science Building
Thurgood Marshall Campus
http://anthro.ucsd.edu

Professors

Guillermo Algaze, Ph.D.
Margaret J. Schoeninger, Ph.D., *Chair*
Shirley C. Strum, Ph.D.
Marc J. Swartz, Ph.D.
Donald F. Tuzin, Ph.D.
Kathryn A. Woolard, Ph.D.

Professors Emeritus

F. G. Bailey, Ph.D., *Academic Senate Career Distinguished Teaching Award*
Roy G. D'Andrade, Ph.D. *(No longer in San Diego)*
David K. Jordan, Ph.D.
Michael E. Meeker, Ph.D. *(No longer in San Diego)*
T. Schwartz, Ph.D. *(Retired, not available)*
Melford E. Spiro, Ph.D.

Associate Professors

Suzanne A. Brenner, Ph.D.
Paul S. Goldstein, Ph.D.
James Holston, Ph.D.
Jim Moore, Ph.D.
Steven M. Parish, Ph.D.
Joel Robbins, Ph.D.

Assistant Professors

Geoffrey Braswell, Ph.D.
Keith E. McNeal, Ph.D.
Nancy G. Postero, Ph.D.
Katerina Semendeferi, Ph.D.

Adjunct Professors

Robert McC. Adams, Ph.D., *Adjunct Professor*
Fred Bercovitch, Ph.D., *Adjunct Professor*
Brian F. Byrd, Ph.D., *Associate Adjunct Professor*
Alan Dixson, Ph.D., *Adjunct Professor*

Associated Faculty

Charles Briggs, Ph.D., *Professor, Ethnic Studies*
Edwin L. Hutchins, Ph.D., *Professor, Cognitive Science*
Martha Lampland, Ph.D., *Associate Professor, Sociology*
Paula F. Levin, Ph.D., *Senior Lecturer S.O.E., Teacher Education Program*
Lawrence A. Palinkas, Ph.D., *Professor, Family and Preventive Medicine, School of Medicine*
Lola Romanucci-Ross, Ph.D., *Professor, Family and Preventive Medicine, School of Medicine*
Christena Turner, Ph.D., *Associate Professor, Sociology*
Lisa Yoneyama, Ph.D., *Associate Professor, Literature*

Anthropology is a humanistic social science dedicated to understanding the worldwide diversity of social institutions and cultural traditions. Because there is increasing awareness of the importance of sociocultural factors in domestic and international relations, a bachelor's degree in anthropology has become accepted as a valuable preparation for careers in law, medicine, education, business, government, and various areas of public service. Anthropology majors can qualify for a California teaching credential from UCSD through the Teacher Education Program. The department offers a full range of courses in cultural, social, psychological and biological anthropology, as well as archaeology. Courses include offerings which focus on specific societies or regions of the world as well as more theoretically oriented materials. The department offers undergraduate minor and major programs, a senior thesis program, an undergraduate internship program, and a graduate program leading to the doctoral degree. Students may also enroll in a Field School when available.

The Undergraduate Program

Lower-Division

Lower-division offerings in anthropology are concentrated mainly in the core series, ANLD 1, 2, 3. These courses are designed to provide a comprehensive orientation to the ideas and methods of anthropological investigation and a familiarity with case materials from a number of different societies and historical periods.

Students who intend to major or minor in archaeological anthropology are advised to take ANLD 3.

Students who intend to major or minor in biological anthropology must take ANLD 2 (or equivalent), which is prerequisite to most upper-division biological anthropology courses.

ANLD 23, which may not be offered every year, satisfies the campus-wide requirement for a course in American Cultures.

Students who have already completed ANPR 105, 106, and 107 may not receive academic credit for ANLD 1.

Other lower-division courses are offered from time to time and will vary from year to year.

The Minor

Students may choose a minor in general anthropology, archaeological anthropology, or biological anthropology. Each consists of seven anthropology courses. At least five courses must be upper-division; at least four should be taken at UCSD. The list of courses offered for each minor is available from the undergraduate coordinator. Transfer credits from other anthropology departments are usually accepted. Education Abroad Program credits are acceptable at the discretion of the undergraduate adviser.

The Major

To receive a B.A. degree with a major in anthropology, the student must meet the requirements of Revelle, John Muir, Thurgood Marshall, Earl Warren, Eleanor Roosevelt College, or Sixth College including the following requirements of the Department of Anthropology:

1. A minimum of twelve four-unit upper-division courses in the Department of Anthropology must be completed.
2. ANPR 105, 106, and 107 must be completed (included as three of the twelve courses required under No. 1, above). All or some of the courses in this sequence are prerequisites for some other upper-division courses. This sequence consists of:

   105 Social Anthropology

   106 Cultural Anthropology

   107 Psychological Anthropology
3. No courses taken in fulfillment of the above requirements may be taken on a Pass/Not Pass (P/NP) basis. (An exception is made for some courses accepted from other schools and for **one** independent study course (199), **or one** directed group study course (198), **and a** combination of **one** internship seminar (ANBI 187A, C or ANPR 187B) with the corresponding academic internship project (AIP 197). However, this exception does not extend to ANPR 105, 106 and 107, or to transfer credits accepted in lieu of them. These must be taken for a letter grade.)
4. For the B.A. degree, a minimum average of 2.0 is required, both as an overall average in all anthropology courses and in the ANPR 105-106-107 sequence considered separately.
5. At least seven of the upper-division courses submitted for the major must be taken at the University of California, San Diego. The seven normally must include ANPR 105, 106, and 107. A transfer course may be accepted in lieu of one of these "core" courses, if, in the opinion of the undergraduate adviser, the content is substantially the same. In no case will transfer credit be accepted in lieu of more than one of these courses.
6. Majors are required to obtain a background in basic statistical techniques. Cognitive Science 14, Psychology 60, Math 10D, and BIEB 100 are recommended as courses to fulfill this requirement.

The Major in Anthropology with Concentration in Archaeology

The department offers an additional B.A. degree, "Anthropology with Concentration in Archaeology." This degree requires the following:

1. The Anthropology Core Sequence: ANPR 105, 106, 107.
2. The Archaeology Core Sequence: ANGN 181, 182, 183.
3. An additional upper-division course in sociocultural anthropology.
4. Five elective courses, three of which must be in archaeology, and the remaining two can be either from offerings in archaeology or in related disciplines. A handout listing these courses is available from the department's undergraduate coordinator. Students are encouraged to participate in the department's Archaeological Field School (ANPR 194) opportunities in the eastern Mediterranean region and San Diego county.

The Major in Anthropology with Concentration in Biological Anthropology

The department offers another B.A. degree, "Anthropology with Concentration in Biological Anthropology." This degree requires the following:

1. The Core Sequence: ANPR 105, 106, 107.
2. Five four-unit anthropology courses identified as biological anthropology courses; ENVR 110 may be substituted for one of these. A handout listing these courses is available from the department's undergraduate coordinator.
3. Four four-unit courses in the Department of Biology; ECON 131 may be substituted for one of these. Courses which are applicable are also listed in the biological anthropology handout.
4. Items 3 through 6 in the above section ("The Major in Anthropology") also apply to the major in anthropology with concentration in biological anthropology.

Senior Thesis Program

The senior thesis is prepared during two successive quarters of ANPR 196, senior thesis research, and is counted as two of the twelve upper-division courses required for a major. Students are admitted to the program by invitation of the faculty. Under normal circumstances, eligibility for the program requires the student (1) to have completed eight upper-division courses, including the core sequence, and (2) to have achieved grade point averages of at least 3.6 both overall and in the anthropology major by the end of the junior year. Some of these requirements may be waived by vote of the faculty. During the first quarter of the program (fall quarter), students select their research topic and write a preliminary paper. Those who receive a B+

or better will be invited to continue in the program and complete a thesis on the chosen topic by the end of the winter quarter. The thesis will be evaluated by a committee consisting of the thesis adviser and one other faculty member appointed by the department chair in consultation with the thesis coordinator. The thesis adviser has the sole responsibility for the grade the student receives in the winter quarter. The reading committee advises the faculty on the merit of the thesis for departmental honors. A senior thesis is required in order to be considered for department honors as commencement.

Students who wish to be considered for the Senior Thesis Program should notify the department's undergraduate adviser by the second week of the spring quarter prior to the senior year.

Internship Program

The department sponsors an internship program that allows students to gain academic credit for supervised work in the Museum of Man, the San Diego Zoo, or the Wild Animal Park. The three tracks of the program allow internship experience in (1) biological anthropology, (2) ethnology and archaeology at the museum, or (3) primate behavior and conservation at the Zoo or Wild Animal Park. A combination of on-campus and on-site supervision makes these courses intellectually provocative but practical and applied. They are an especially valuable complement to a major or minor in anthropology. One four-unit internship (AIP 197) taken with the corresponding two-unit internship seminar (ANBI 187A, C and ANPR 187B) can be counted as one of the twelve upper-division courses for the anthropology major or minor. Applications to these programs are accepted during the first seven weeks of the quarter before the one in which the internship is to be done.

Academic Enrichment Programs

Faculty Mentor Program

The program offers research experience to any junior or senior with a GPA of 2.7 or higher who wants to prepare for graduate or professional school. Participants work as research assistants to UCSD faculty members during the winter and spring quarters. Students present their research papers at the Faculty Mentor Research Symposium at the conclusion of the program in the spring.

Summer Research Program

The program offers full-time research experience to under-represented (i.e., minorities, women, and low-income, first-generation college) students who are interested in preparing for careers in research or university teaching. Juniors and seniors who have a 3.0 GPA or above and plan to attend graduate or professional school are eligible to participate.

Education Abroad Program

One of the best ways to understand the concept of "culture" is to live in a different culture for a time. Anthropology majors are encouraged to participate in the UC Education Program (EAP) or UCSD's Opportunities Abroad Program (OAP). Students considering this option should discuss their plans with the faculty undergraduate adviser before going abroad, and courses taken abroad must be approved for credit to the major by the adviser upon return. More information on EAP and OAP is provided under the Education Abroad Program in the UCSD General Catalog. Interested students should contact the EAP staff in the International Center.

The Graduate Program

The Department of Anthropology offers graduate training in social, cultural, and psychological anthropology, anthropological archaeology, and biological anthropology. The graduate program is designed to provide the theoretical background and the methodological skills necessary for a career in research and teaching anthropology at the university level, and for the application of anthropological knowledge to contemporary problems. It is assumed that all students enter with the goal of proceeding to the doctoral degree.

Admission to the graduate program occurs in the fall quarter only.

Graduate Advising

One member of the departmental faculty functions as the graduate adviser. The role of graduate adviser is to inform students about the graduate program, approve individual registration forms, and give assistance with respect to administrative matters. After completion of the requirements for the master's degree, the chair of the student's doctoral committee serves as the student's major adviser.

Any decision to waive a requirement for either the master's degree or the Ph.D. must be made by a majority of the faculty.

Evaluation

In the spring of each year, the faculty evaluate each student's overall performance in course work, apprentice teaching, and in research progress. A written assessment is given to the student after the evaluation. If a student's work is found to be inadequate, the faculty may determine that the student should not continue in the graduate program.

The Master of Arts Degree

Students entering the doctoral program must complete a master's degree before continuing toward the doctorate. Entering students who already have a master's degree in anthropology are not permitted by university regulations to receive a second social science or related field master's degree, but are required by the department to complete the requirements for the master's degree. Rare exceptions may be made on a case by case basis by the consent of the majority of the faculty and approval of the Office of Graduate Studies and Research.

Requirements for Master's Degree

Required Courses:

230	Departmental Colloquium (4 quarters, 1 unit each)
281A-B	Introductory Seminars (1 unit each)
295	Master's Thesis Preparation (1–12 units)

Four of the following six core courses, as designated by the sub-field to which the student has been admitted:

Students must take four core courses out of a total pool of six courses identified as "Core." One of these will be an integrated core course to be taken during the first year. The other three required courses will be specified by faculty of the three sub-fields now identified within the department (Sociocultural, Anthropological Archaeology, and Biological Anthropology) for the students admitted to their respective tracks.

ANGR 280A. Core Seminar in Social Anthropology (4 units)
ANGR 280B. Core Seminar in Cultural Anthropology (4 units)
ANGR 280C. Core Seminar in Psychological Anthropology (4 units)
ANGR 280D. Core Seminar in Anthropological Archaeology (4 units)
ANGR 280E. Core Seminar in Biological Anthropology (4 units)
ANGR 280F. Integrated Core Seminar (4 units) (Required for all first year students)

Elective Courses

Four elective, letter grade courses are required. Required courses may not be counted as elective courses, although the Integrated Core Seminar (ANGR 280F) may be repeated in another year for elective credit (provided the teaching staff for the course have changed). Two of these elective courses must be within the anthropology department. Other electives may be taken outside of the department with the approval of the department chair or the graduate adviser.

Master's Thesis

Students must complete a master's thesis of roughly sixty pages which will be due on the first day of the winter quarter of the student's second year. They must have completed three quarters of coursework in order to begin writing a master's thesis. By the end of the spring quarter of the student's first year, he/she will have a master's committee in consultation with whom he/she will design the thesis. The graduate adviser will be responsible for organizing the masters' committees. The thesis will be literature based but will have its own argument, and will not simply be a review of the literature.

An option open only to anthropological archaeology and biological anthropology students is to make the literature-based thesis (defended by the beginning of the winter quarter of the second year) one component of a larger project involving the collection of original data. Data collection could begin in the summer after the student's first year and analysis of it could continue after the master's thesis has been defended. If the thesis includes the analysis of original data which must be shipped back from the field, the student would write the thesis during the winter quarter and hand it in on the first day of the spring quarter.

The Doctoral Degree

Continuation in the doctoral program is granted to students who have satisfactorily completed the master's program and who have completed courses and the master's thesis at a level of excellence which indicates promise of professional achievement in anthropology.

Requirements for the Doctoral Degree

1. Required Courses

In order to achieve candidacy, students must complete two additional letter grade electives beyond the four required for the Masters.

Only one 290-level course may be taken in any one quarter until a student attains Ph.D. candidacy.

2. Research Methods

Students are required to develop a plan for their training in research methods and present it to the anthropology department faculty on their proposed dissertation committee in the spring quarter of their second year.

3. Apprentice Teaching

In order to acquire teaching experience, each student in the graduate department is required to participate in the teaching activities designated by the department. Teaching may be in the anthropology department or in any other department or program on campus. It can be fulfilled anytime in the first four years of residence. The requirement can be waived by the faculty. The teaching requirement is discharged under the auspices of the course titled ANGR 500: Apprentice Teaching or comparable number in the relevant teaching areas. (1 quarter, 4 units, S/U grade.)

4. Foreign Language

Unless a student is planning on fieldwork in English-speaking areas, knowledge of one or more foreign languages may be essential for the successful completion of a Ph.D. in anthropology at UCSD. Students will determine specific language requirements for their degree in consultation with the faculty and their doctoral committee.

5. Formation of the Doctoral Committee

Students should choose their doctoral committee by the end of the second year. They must have the completed committee by the end of the first week of the fall quarter of their third year. In consultation with the chair of the doctoral committee, two more departmental committee members are selected, and two faculty members from outside of the department are added. One of the outside members must be tenured.

Anthropologists in other departments who are identified by the faculty may serve as either inside members or outside members of the committee. However, there must be at least two inside members from within the department, and only one outside member may be an anthropologist. The final composition of the committee is approved by the Office of Graduate Studies and Research.

The chair of the doctoral committee serves as the student's adviser for the remainder of the student's program.

6. The Fieldwork Proposal

Advancement to Candidacy will be based on the submission of a research proposal of fifteen to thirty double-spaced pages and three papers of fifteen to twenty double-spaced pages in length.

One paper must be submitted in each quarter. The papers should be fifteen to twenty double spaced pages in length. They will usually be in the areas of theory, methods and area, though in some cases a different breakdown of the papers will be allowed in consultation with the student's committee. Three directed reading courses will be allowed in the preparation of the papers (one each in the spring of the second year and the fall and winter of the third year.) All papers and the exam must be completed by the end of a student's third year, though they may be completed earlier. The proposal and all papers must be turned in three weeks prior to the examination.

7. Advancement to Candidacy

In the spring quarter of the third year, after completion of all of the above requirements and submission of the papers and proposal, the student sits for the oral qualifying examination administered by the student's committee, as required by the Office of Graduate Studies and Research. This examination may contain questions on any aspect of anthropology, but focuses particularly upon the merits of the student's field research proposal, areas covered in the papers, and accompanying field statements.

Successful completion of this examination marks the student's advancement to doctoral candidacy. These exams will be open to the extent that university regulations allow.

8. Dissertation and Dissertation Defense

Upon completion of the dissertation research project, the student writes a dissertation which must be successfully defended in an oral examination conducted by the doctoral committee and open to the public. This examination may not be conducted earlier than three quarters after the date of advancement to doctoral candidacy. A full copy of the student's dissertation must be in the hands of each of the student's doctoral committee members four weeks before the dissertation hearing. An abstract of the student's dissertation must be in the hands of all faculty members ten days before the dissertation defense. It is understood that the edition of the dissertation given to committee members will not be the final form, and that the committee members may suggest changes in the text at the defense. Revisions may be indicated, requiring this examination to be taken more than once. Acceptance of the dissertation by the university librarian represents the final step in completion of all requirements for the Ph.D.

9. Time Limits

Pre-candidacy status is limited to three years. Candidates for the doctorate remain eligible for university support for eight years. Instructional support (teaching assistantships) is limited to six years (eighteen quarters). The doctoral dissertation must be submitted and defended within nine years. This is in accordance with university policy.

Introduction to Required Core Courses

ANGR 280A. Core Seminar in Social Anthropology. First-year core seminar focuses on individual action and social institutions.

ANGR 280B. Core Seminar in Cultural Anthropology. First-year core seminar focuses on personal consciousness and cultural experience.

ANGR 280C. Core Seminar in Psychological Anthropology. First-year core seminar focuses on motives, values, cognition, and qualities of personal experience.

ANGR 280D. Core Seminar in Anthropological Archaeology. Integral part of the training for graduate students focusing on Anthropological Archaeology. It is one of a set of core anthropology courses available to graduate students; required of first-year anthropological archaeology students but open for students in other sub-fields.

ANGR 280E. Core Seminar in Biological Anthropology. This seminar will examine the central problems and concepts of biological anthropology, laying the foundation for first-year graduate students in Biological Anthropology as well as providing an overview of the field for graduate students in other areas of anthropology.

ANGR 280F. Integrated Core Seminar. Two faculty members from different sub-fields (sociocultural, anthropological archaeology, and biological anthropology) address issues of mutual interest, illustrating areas of overlap between the aspects of anthropology. REQUIRED OF ALL FIRST-YEAR STUDENTS.

ANGR 281 A-B. Introductory Seminars. These seminars are held in the first two quarters of the first year of graduate study. Faculty members will present an account of their current research and interests. When appropriate a short preliminary reading list will be given for the particular lecture.

NOTE: Not all anthropology courses are offered every year. Please check the quarterly UCSD Schedule of Classes issued each Fall, Winter, and Spring, for specific courses.

The Melanesian Studies Resource Center and Archive

These facilities embody the substantial interests in the Pacific Basin that are represented on the UCSD campus and the special prominence of the UCSD Department of Anthropology in the study of cultures and societies of Oceania and especially of Melanesia. In cooperation with the UCSD libraries, the Melanesian Studies Resource Center and Archive has two major projects. First, there is an ongoing effort to sustain a library collection of monographs, dissertations, government documents, and journals on Melanesia that make UCSD the premier center for such materials in the United States. Second, there is an endeavor to collect the extremely valuable unpublished literature on Melanesia, to catalog such materials systematically, to produce topical bibliographies on these holdings, and to provide microfiche copies of archival papers to interested scholars and to the academic institutions of Melanesia. This innovative archival project is intended to be a model for establishing special collections on the traditional life of tribal peoples as dramatic social change overtakes them. In the near future, anthropological research on tribal peoples will take place largely in archives of this kind. These complementary collections will support a variety of research and teaching activities and are already attracting students of Melanesia to this campus.

The Melanesian Studies Resource Center and Archive are directed by members of the Department of Anthropology faculty, in collaboration with Geisel Library.

The Archaeological Research Laboratory

Archaeology laboratories were established at UCSD in 1995. The present facilities are geared to the study of lithics, ceramics, biological remains, and other small finds retrieved on faculty expeditions in the old and new worlds, including Belize, Israel, Jordan, and Peru. Multimedia research, AutoCAD, and other computer based studies are carried out in the lab. Undergraduate and graduate students are encouraged to participate in lab studies.

The Biological Anthropology Laboratory

The biological anthropology laboratories have twin missions in teaching research. They house collections of modern skeletal material and fossil hominid casts used for teaching both at the lab and in local outreach presentations. The primary research focus involves a large collection of histological sections and computerized images of living and postmortem human and non-human primate brains that were obtained through magnetic resonance scans. These are reconstructed in 3D using state-of-the-art equipment for comparative analysis and study of the evolution of the human brain. Undergraduate and graduate student involvement in the lab is welcomed.

The Anthropology of Modern Society Faculty Research Group

The Anthropology of Modern Society is a project of graduate training and research dedicated to the critical study of modernity and its

counterpoints. The group is concerned with the changing nature of membership in modern society. Its participants focus on issues of citizenship and democracy, social formations in tension with the nation-state, modern subjectivities, social and religious movements, governmental rationalities and public works, transnational markets and migrations, relations of local to global processes within the current realignments of regional, national, and transnational sovereignties, and the social life of cities as making manifest these kinds of concerns. Participants are committed to reorienting anthropological theory and ethnographic practice towards such contemporary social and political problems. Guiding this project is the group's interest in combining critical theory with a comparative and empirically grounded study of cases to constitute an anthropology of modernity.

Director: James Holston, Department of Anthropology, (858) 534-0111.

COURSES

Note: Not all courses are offered every year. Please check the quarterly Schedule of Classes for specific courses issued fall 2004, winter 2005, and spring 2005.

ANTHROPOLOGY: LOWER-DIVISION

ANLD 1. Introduction to Culture (4)
An introduction to the anthropological approach to understanding human behavior, with an examination of data from a selection of societies and cultures.

ANLD 2. Human Origins (4)
An introduction to human evolution from the perspective of physical anthropology, including evolutionary theory and the evolution of the primates, hominids, and modern humans. Emphasis is placed on evidence from fossil remains and behavioral studies of living primates. *Prerequisite for upper-division biological anthropology courses.*

ANLD 3. World Prehistory (4)
This course examines theories and methods used by archaeologists to investigate the origins of human culture. A variety of case studies from around the world are examined. *(Recommended for many upper-division archaeology courses.)*

ANLD 5: The Human Skeleton (4)
This course will introduce students to all the bones in the body with an emphasis on function by detailing areas of muscle attachment and bone shape.

ANLD 7: The Paradox of Social Life (4)
Humans being as selfish as they are, how can they live together? Beginning with the imagined "social contract," an examination of a variety of societies aims at showing the basis for the unlikely fact of human sociability.

ANLD 8. Freshman Honors Seminar (4)
Special seminar for a select group of outstanding first-year undergraduates. Course content will shift according to the interests of the instructor. *Prerequisites: freshman standing, ANLD 1 or Making of the Modern World 1, and by invitation.*

ANLD 13. The Mysterious Maya (4)
The archaeology, anthropology, and history of the ancient Maya civilization, which thrived in Mexico and Central America from 1000 B.C. until the Spanish conquest.

ANLD 23. Debating Multiculturalism: Race, Ethnicity, and Class in American Societies (4)
This course focuses on the debate about multiculturalism in American society. It examines the interaction of race, ethnicity, and class, historically and comparatively, and considers the problem of citizenship in relation to the growing polarization of multiple social identities.

ANLD 42. The Study of Primates in Nature (4)
Major primate field studies will be studied to illustrate common features of primate behavior and behavioral diversity. Topics will include communication, female hierarchies, protocultural behavior, social learning and tool use, play, cognition and self-awareness. *(Prerequisite for several upper-division biological anthropology courses.)*

ANLD 87. Freshman Seminar (1)
The Freshman Seminar Program is designed to provide new students with the opportunity to explore an intellectual topic with a faculty member in a small seminar setting. Freshman seminars are offered in all campus departments and undergraduate colleges. Topics vary from quarter to quarter. Enrollment is limited to 15–20 students, with preference given to entering freshmen. *Prerequisites: none.*

ANLD 90. Undergraduate Seminar (1)
The seminar will focus on a variety of issues and special areas in the field of anthropology. The seminar will meet a total of eight hours during the quarter.

ANTHROPOLOGY: PROGRAM COURSES

ANPR 105. Social Anthropology (4)
A systematic analysis of social anthropology and of the concepts and constructs required for cross-cultural and comparative study of human societies. *Prerequisite: upper-division standing. (Required for all majors in anthropology.)*

ANPR 106. Cultural Anthropology (4)
A web of problematic meanings lies behind social relationships and institutional frameworks. This perspective plays an important role in the discussion of human affairs. Course considers the concept of culture in anthropology as a particularly forceful statement of such a perspective. *Prerequisite: upper-division standing. (Required for all majors in anthropology.)*

ANPR 107. Psychological Anthropology (4)
Interrelationships of aspects of individual personality and various aspects of sociocultural systems are considered. Relations of sociocultural contexts to motives, values, cognition, personal adjustment, stress and pathology, and qualities of personal experience are emphasized. *Prerequisite: upper-division standing. (Required for all majors in anthropology.)*

ANPR 187B. Intern Seminar in Ethnography and Archaeology (2)
Seminar complements students' research in the Academic Internship Program in ethnography and archaeology at the Museum of Man. Readings and discussions focus on problems in the analysis of material culture and classifications of artifacts and site excavations. Research paper required. *Prerequisites: ANPR 106 and simultaneous enrollment in Warren 197: Ethnography Archaeology-Museum of Man. (P/NP grades only.) Department approval required.*

ANPR 194S. Middle East Archaeological Field School (12)
The archaeological field school will take place in Jordan. It is an introduction to the design of research projects, the techniques of data collection, and the methods of excavation. Includes post-excavation lab work, study trips, and field journal. *Prerequisite: upper-division standing or consent of instructor.*

ANPR 195. Instructional Apprenticeship in Anthropology (4)
Course gives students experience in teaching of Anthropology at the lower-division level. Students, under direction of instructor, lead discussion sections, attend lectures, review course readings, and meet regularly to prepare course materials and evaluate examinations and papers. Course not counted toward minor or major. *Prerequisites: consent of instructor and department stamp, upper-division standing, grade of A in course to be taught or equivalent.*

ANPR 196A. Thesis Research (4)
Independent preparation of a senior thesis under the supervision of a faculty member. Completion of this course with a grade of at least B+ is a prerequisite to ANPR 196B. *Prerequisites: students will be admitted by invitation of the department. Department approval required.*

ANPR 196B. Thesis Research (4)
Independent preparation of a senior thesis under the supervision of a faculty member. Students begin two-quarter sequence in fall quarter. *Prerequisite: completion of ANPR 196A with grade of B+ or better.*

ANPR 197. Field Studies (4)
Individually arranged field studies giving practical experience outside the university. *Prerequisites: consent of instructor and department approval required. (P/NP grades only.)*

ANPR 198. Directed Group Study (2-4)
Directed group study on a topic or in a field not included in the regular departmental curriculum by special arrangement with a faculty member. *Prerequisites: consent of instructor and upper-division standing. (P/NP grades only.) Department approval required.*

ANPR 199. Independent Study (2-4)
Independent study and research under the direction of a member of the faculty. *Prerequisites: consent of instructor. (P/NP grades only.) Department approval required.*

ANTHROPOLOGY: BIOLOGICAL ANTHROPOLOGY

These courses can be counted for the biological anthropology minor or concentration.

ANBI 100: Special Topics in Biological Anthropology (4)
Course usually taught by visiting faculty in biological anthropology. Course will vary in title and content. When offered, the current description and title is found in the current Schedule of Classes and the anthropology department Web site. (Can be taken a total of four times as topics vary.)

ANBI 101: Special Topics in Bio-Medical Anthropology (4)
Course usually taught by visiting faculty in bio-medical anthropology. Course will vary in title and content. When offered, the current description and title is found in the current Schedule of Classes and the anthropology department Web site. (Can be taken a total of four times as topics vary.)

ANBI 110. Perspectives on Human Evolution (4)
Special seminar for students who wish to explore advanced topics in biological anthropology. Course focus will change year to year. May be repeated one time for credit. *Prerequisites: upper-division standing, ANLD 2, one other course in biological anthropology, and consent of instructor. Department approval required.*

ANBI 116: The Evolution of Primate Reproduction (4)
This course examines reproductive biology and its evolution among the Order Primates. Lectures cover the hormonal control of sexual and parental behavior, the evolution of mating systems, mating tactics, and sexual selection. Human reproduction is considered in the comparative perspective. *Prerequisites: upper-division standing, ANLD 2: Human Origins or comparable, or consent of instructor.*

ANBI 132. Conservation and the Human Predicament (4)
(Same as BIEB 176.) Interdisciplinary discussion of the human predicament, biodiversity crisis, and importance of biological conservation. Examines issues from biological, cultural, historical, economic, social, political, and ethical perspectives emphasizing new approaches and new techniques for safeguarding the future of humans and other biosphere inhabitants. *Prerequisite: upper-division standing, ANLD 2 or consent of instructor.*

ANBI 133. The Cultural Ecology of Health (4)
The goal of this course is to place health in a cultural and ecological framework, using an evolutionary (through time) and worldwide perspective. *Prerequisite: upper-division standing.*

ANBI 139. Introduction to the Primate Brain (4)
Examination of the basic organization of the human and non-human primate brain with an emphasis on structures involved in cognitive behaviors, emotions, and responses to social stimuli. Introduction to the field of comparative neuroanatomy as applied on selected anthropoid species. *Prerequisite: upper-division standing.*

ANBI 140. The Evolution of the Human Brain (4)
Introduction to the organization of the brain of humans and apes. Overview of the theoretical perspectives on the evolution of the primate cortex and limbic system. Exposure to contemporary techniques applied to the comparative study of the hominoid brain. *Prerequisite: upper-division standing.*

ANBI 141: The Evolution of Human Diet (4)
The genotype of our ancestors had no agriculture or animal domestication, or rudimentary technology. Our modern diet contributes to heart disease, cancers, and diabetes. This course will outline the Natural Diet of Primates and compare it with early human diets. *Prerequisite: upper-division standing.*

ANBI 142: The Primate Skeleton (4)
This course will compare long bones, head, and torso shape in tree-living and ground-living primates. The emphasis is on correlating locomotion with bone shapes. *Prerequisite: ANLD 42: The Study of Primates in Nature*

ANBI 144: Human Anatomy (4)
This course will introduce students to the internal structure of the human body through dissection tutorials on CD ROM. *Prerequisite: ANLD 5: The Human Skeleton or related course.*

ANBI 145: Bioarchaeology (4)
How are skeletal remains used to reconstruct human livelihoods throughout prehistory? The effects of growth, use, and pathology on morphology and the ways that skeletal remains are understood and interpreted by contemporary schools of thought. *Prerequisite: ANLD 5: The Human Skeleton, related course, or consent of instructor.*

ANBI 146: Stable Isotopes in Ecology (4)
The stable isotopes of carbon, nitrogen, oxygen, and hydrogen in animal tissues, plant tissues, and soils indicate aspects of diet and ecology. The course will introduce students to this approach for reconstructing paleo-diet, paleo-ecology, and paleo-climate.

ANBI 147: American Creationism (4)
Over the last several decades in North America an attack has been directed toward organic evolution as the explanation for the origin of life, especially as it relates to humans. The course will review the history of the movement and its implications.

ANBI 148. Primate Behavioral Ecology (4)
The course examines various behaviors (e.g., group formation, dispersal, parenting, coalition formation) from a comparative and evolutionary perspective. Observational methodology and analytical methods will also be discussed. Lab sections are required. *Prerequisites: upper-division standing. ANLD 42. Strongly recommended: BIEB 100, Biometry or comparable statistics course, and BIEB 164, Sociobiology.*

ANBI 159. Biological and Cultural Perspectives on Intelligence (4)
Attitudes toward other individuals (and species) are often shaped by their apparent "intelligence." This course discusses the significance of brain size/complexity, I.Q. tests, communication in marine mammals and apes, complex behavioral tactics, and the evolution of intelligence. *Prerequisites: upper-division standing, any one of the following: ANLD 2, 42, BILD 3, or consent of instructor.*

ANBI 161. Human Evolution (4)
Interpretation of fossil material–its morphology, variation, phylogenetic relationships, reconstruction of ecological settings and cultural patterns of early human life–demands the integration of many disciplines. Lectures cover major stages of human evolution, time ranges, distribution, archaeology, and distinctive morphology. *Prerequisite: ANLD 2 or consent of instructor.*

ANBI 173. Cognition in Animals and Humans (4)
(Previously titled: The issues of consciousness in animals and humans.) The last divide between humans and other animals is in the area of cognition. A comparative perspective to explore recent radical reinterpretations of the cognitive abilities of different primate species, including humans and their implications for the construction of evolutionary scenarios. *Prerequisite: upper-division standing, ANLD 2 or introductory course in evolution/animal behavior or consent of instructor.*

ANBI 175. Modeling the Behavior of our Early Ancestors (4)
Models of human evolution combine science and myth. This course examines methods used in reconstructions of human evolution. Models such as "man the hunter" and "woman the gatherer" are examined in light of underlying assumptions, and cultural ideals. *Prerequisite: upper-division standing, ANLD 2 or equivalent.*

ANBI 187A. Intern Seminar in Physical Anthropology (2)
Seminar complements students' research in the Academic Internship Program in physical anthropology at the Museum of Man. Readings and discussions focus on anatomy, pathology, and classification and x-ray analysis of skeletal remains. Research paper required. *Prerequisites: ANLD 2 and simultaneous enrollment in Warren 197: Physical Anthropology-Museum of Man. (P/NP grades only.) Department approval required.*

ANBI 187C. Intern Seminar in Ethology (2)
Seminar complements students' research in the Academic Internship Program at the San Diego Wild Animal Park and/or Zoo. Focus on problems of analysis in observational study of animal behavior and conservation in relation to ethological studies. Research paper required. *Prerequisites: ANLD 2 and one upper-division course in animal behavior, either in anthropology or biology. To qualify, must be last-quarter junior or senior with a 3.3 GPA. Simultaneous enrollment in Warren 197: Ethology Zoo. (P/NP grades only.) Department approval required.*

ANTHROPOLOGY: GENERAL

ANGN 100: Special Topics in Socio-Cultural Anthropology (4)
Course usually taught by visiting faculty in socio-cultural anthropology. Course will vary in title and content. When offered, the current description and title is found in the current Schedule of Classes and the anthropology department Web site. (Can be taken a total of four times as topics vary.)

ANGN 101: Special Topics in Anthropological Archaeology (4)
Course usually taught by visiting faculty in anthropological archaeology. Course will vary in title and content. When offered, the current description and title is found in the current Schedule of Classes and the anthropology department Web site. (Can be taken a total of four times as topics vary.)

ANGN 103: The Archaeology of Hunters-Gatherers (4)
Course examines current theoretical issues in the field of hunter-gatherer archaeology. Considerable emphasis is given to ethnographic and ethno-archaeological sources for understanding such topics as prehistoric hunter-gatherer adaptations, culture change, social organization, and inter-group interaction. *Prerequisite: ANLD 3 recommended.*

ANGN 104. Anthropology of Fantasy (4)
A theoretical examination of the sources and relationships of public and private fantasy, based on cross-cultural studies of dreams, myths, and ritual.

ANGN 108. Archaeology of the UCSD Campus (4)
Our campus houses some of the earliest human settlements in North America. This course reviews the archaeology, climate, and environment of the sites and outlines research aimed at understanding the lives of these early peoples. *Prerequisite: upper-division standing. Permission of instructors.*

ANGN 112. Language, Identity, and Community (4)
This course examines the use of language difference in negotiating identity in bilingual and bidialectal communities, and in structuring interethnic relations. It addresses social tensions around language variation and the social significance of language choices in several societies.

ANGN 114: Culture and Human Values (4)
The role of values in human society will be analyzed. Class work will include projects to develop ways of measuring values, as well as collecting and analyzing data.

ANGN 117. Anthropology of Education (4)
This course considers ways in which language and culture influence educational goals and processes. Cultural and sociolinguistic explanations of school successes and failures are examined.

ANGN 118. Cognitive Anthropology (4)
This course explores the relation between culture and cognition. Topics include cultural influences on belief systems, reasoning, perception, and motivation. The teaching style for the course is discussion and lecture, with simple classroom demonstrations. *Prerequisite: upper-division standing.*

ANGN 119. Archaeological Field and Lab Class (8)
The archaeological field and laboratory class will take place at San Elijo Lagoon, San Diego County. It is an introduction to the research design of interdisciplinary projects, the technique of data collections, the methods of excavation and post-excavation lab work. *Prerequisite: none.*

ANGN 120. Anthropology of Religion (4)
Explores religious life in various cultures. Topics addressed include the problem of religious meaning, psychocultural aspects of religious experience, religious conversion and revitalization, contrasts between traditional and world religions, religion and social change. *Prerequisite: upper-division standing.*

ANGN 121. Digital Archaeology: GIS Foundations (4)
Concerns modern archaeological data with Geographic Information Systems and performing spatial analysis. Lectures and lab exercises—learn spatio-temporal analysis techniques with interactive online computer mapping. Hands-on skills with ArcView, GIS, and several ArcView extensions. *Prerequisite: none.*

ANGN 122. Advanced Digital Archaeology Lab (4)
Expands GIS knowledge in group project meetings and discussions interspersed with lectures on more advanced topics integrating GIS and digital archaeology. Student GIS projects will be converted into interactive online presentations integrating maps, text documents, and archaeological imagery. *Prerequisite: permission of instructor.*

ANGN 125. Gender, Sexuality, and Society (4)
How are gender and sexuality shaped by cultural ideologies, social institutions, and social change? We explore their connections to such dimensions of society as kinship and family, the state, religion, and popular culture. We also examine alternative genders/sexualities cross-culturally. (**Note**: Students who have taken ANRG 117: Gender Across Cultures may not take this course for credit.)

ANGN 128. The Anthropology of Medicine (4)
(Same as Cont. Issues 136.) We examine the medical profession, the sick and the healers, and culture as communication in the medical event through aspects of medical practice and medical research of medicine as well as primitive and peasant systems. *Prerequisite: upper-division standing.*

ANGN 130. The Political Economy of Early Empires (4)
Archaeological and textual evidence for selected early empires of pre-Columbian America and the Ancient Near East will be used to illuminate cross-cultural similarities and differences in the ways complex pre-capitalistic societies acquired, produced, exchanged, and distributed wealth. *Prerequisite: upper-division standing. ANLD 3: World Prehistory is recommended.*

ANGN 135. Bodies and Boundaries: Symbols in Ritual and Everyday Life (4)
This course looks at symbols in sacred and mundane spheres of life. Topics include ritual and religious symbolism; the symbolism of gender, sex, and body; representations in popular culture; and the manipulation of symbols to establish and transgress boundaries.

ANGN 142. Pastoralism in Archaeological and Ethnographic Perspective (4)
Pastoralism is a distinctive form of human subsistence which evolved and is often intertwined with farming societies. These societies are examined using archaeological and ethnographic materials from the Near East and Africa. *Prerequisite: upper-division standing, ANLD 3 is recommended.*

ANGN 149. Language in Society (4)
After a brief introduction to linguistic concepts, the course covers the relations between culture and language, how languages reflect culture, how languages change, language and social life, language and political policy.

ANGN 151. Political Anthropology (4)
Humans are goal seekers, some with public goals. Course considers ways goals are pursued, which are desirable, and how this pursuit is carried out at the local level with attention to the parts played by legitimacy and coercion.

ANGN 154. Patterns of Conquest and Colonization (4)
Centuries of European worldwide expansion, resting largely on military superiority, had profound effects on indigenous ecosystems, states, and peoples. The rise, decline, and continuing effects of this are traced in subsistence, demography, economic relationships, and colonial and post-colonial political systems.

ANGN 157. The Analysis of Systematic Data (4)
This course will examine the techniques and logic of statistical methods used by anthropologists, including correlation and various measures of association, ANOVA, principal components, cluster analysis, and correspondence analysis. Simple graphic techniques will also be considered. *Prerequisite: basic lower-division course in statistics.*

ANGN 160. Nature, Culture, and Environmentalism (4)
Course examines theories concerning the relation of nature and culture. Particular attention is paid to explanations of differing ways cultures conceptualize nature. Along with examples from non-western societies, the course examines the western environmental ideas embedded in contemporary environmentalism.

ANGN 163. Evolution of Technology (4)
(Formerly titled Technological Revolutions and Evolution) While not really existing outside the social order, technological systems are basic to civilization. Across six millennia, this course examines their growth—complex, largely indeterminate, and marked by irregular spurts of acceleration. While comparative, it concentrates on England and America.

ANGN 167. Rituals and Celebrations (4)
Explores the nature and significance of ritual. The course will examine religious rituals, civic festivals, and popular celebrations. Topics include ritual symbolism, social and psychological aspects of ritual, life cycle rites, urban festivals, ritual theory.

ANGN 170. Research Design in Anthropological Archaeology (4)
This course trains students to design, implement, and conduct research in anthropological archaeology. Writing and presenting work in progress will take place in a seminar like forum. *Prerequisite: junior/senior standing.*

ANGN 172. Life-History Seminar and Practicum (4)
Examines life-history research as a method for understanding the cultural and psychological experience of people. Combines reading of life-histories with training in life-history research methods. Students develop a life-history project, conduct interviews, and analyze data. *Prerequisites: upper-division. ANPR107 or concurrent enrollment in ANPR 107. Consent of instructor.*

ANGN 173. General Theory (4)
This course will consider theories in anthropology and related fields which treat culture, society, and personality as causal factors in explaining human action. Emphasis will be on the propositional structures of such theories rather than the comparison of particular theorists.

ANGN 181. Anthropological Archaeology (4)
As part of the broad discipline of anthropology, archaeology provides the long chronological record needed for investigating human and social evolution. The theories and methods used in this field are examined. (Archaeology core sequence course.) *Prerequisite: ANLD 3 is recommended.*

ANGN 182. Origins of Agriculture and Sedentism (4)
Varying theoretical models and available archaeological evidence are examined to illuminate the socio-evolutionary transition from nomadic hunter-gathering groups to fully sedentary agricultural societies in the Old and New World. (Archaeology core sequence course.) *Prerequisite: ANLD 3 is recommended.*

ANGN 183. Chiefdoms, States, and the Emergence of Civilizations (4)
The course focuses on theoretical models for the evolution of complex societies and on archaeological evidence for the development of various pre- and protohistoric states in selected areas of the Old and New Worlds. (Archaeology core sequence course.) *Prerequisite: ANLD 3 is recommended.*

ANGN 184. Archaeology, Anthropology, and the Bible (4)
The relationship between archaeological data, historical research, the Hebrew Bible, and anthropological theory are explored along with new methods and current debates in Levantine archaeology. *Prerequisite: upper-division standing.*

ANGN 189. The Anthropology of the End of the World: Millenarian Movements Across Cultures (4)
Course focuses on historical and contemporary millenarian movements in the western and non-western world. Topics addressed include origins, role of prophets, conceptions of time, relation to politics and influence on social change. Examples include Christian and non-Christian movements.

ANTHROPOLOGY: REGIONAL

ANRG 104. Traditional African Societies and Cultures (4)
Attention to three main sociopolitical types of societies: egalitarian hunting and gathering groups, loosely organized agricultural and herding groups, and centrally organized kingdoms. Representatives are considered, and societies from all parts of sub-Saharan Africa studied intensively. *Prerequisite: upper-division standing.*

ANRG 108. Hinduism (4)
An anthropological introduction to Hinduism, focusing on basic religious concepts and practices. Topics include myth, ritual, and symbolism; forms of worship; gods and goddesses; the roles of priest and renouncer; pilgramages and festivals; the life cycle; popular Hinduism, Tantrism. *Prerequisite: upper-division standing.*

ANRG 114. Urban Cultures in Latin America (4)
This course examines four interrelated and historically structured themes of urban culture in Latin America: the role of cities in organizing national space and society; immigration and race; modernism; and popular culture as new religion, music, and film.

ANRG 114-XL. Foreign Language Discussion—Urban Cultures in Latin America (1)
Students will exercise advanced foreign language skills to discuss materials and the correspondingly numbered anthropology language foreign area course. This section is taught by the course instructor, has no final exam, and does not affect the grade in the course, ANRG 114. Urban Cultures in Latin America. *Prerequisite: Concurrent enrollment in ANRG 114.*

ANGN 115: The Foundation for Social Complexity in the Near East (4)
This course critically examines the theoretical models and archaeological evidence of nascent social complexity and inequality in the Near East. The time period under consideration encompasses the shift from generalized hunting and gathering through complex hunter-gatherers to large-scale agricultural communities.

ANRG 116. The Archaeology of Society in Syro-Palestine (4)
Syro-Palestine, the area which includes Israel and adjacent regions, provides a microcosm of social evolution in the eastern Mediterranean. Course examines the archaeological evidence for social change from the emergence of complex societies (ca. 10,000 B.C.E.) to the Israelite kingdoms (ca. 586 B.C.E.). *Prerequisite: upper-division standing.*

ANRG 121. The Archaeology of South America (4)
This course will examine archaeological evidence for the development of societies in the South American continent. From the initial arrival of populations through to the Inca period and the arrival of the Spaniards. *Prerequisite: upper-division standing.*

ANRG 122. Peoples and Cultures of the Middle East (4)
This course explores the living structures, family and gender relations, economy, and religion in the Middle East. We will especially focus on how people come to terms with recent transformations such as nationalism, literacy, globalism, and Islamism. *Prerequisite: upper-division standing.*

ANRG 124. Paths to European Hegemony (4)
Diverse, mostly traumatic cultural encounters accompanied European expansion across most of the world from the later Middle Ages onward. Historically and geographically wide-ranging, this course examines how the asymmetric patterns of interaction then imposed are only slowly being replaced. *Prerequisite: upper-division standing.*

ANRG 132. Modernity in Brazil (4)
Construction of Brazilian modernity through four perspectives: Liberalism among slave-owning elites compared with democratic citizenship among contemporary poor, millenarian religions; construction of the urban periphery by residents; and a modernist theory (antropofagia) about authentic versus imported culture. *Prerequisite: upper-division standing.*

ANRG 143. Indigenous Peoples of Latin America (4)
Indigenous peoples in the Americas have long been dominated and exploited. They have also resisted and reworked the powerful forces affecting them. This course will trace this centuries-long contestation, focusing on ways anthropological representations have affected those struggles. *Prerequisite: upper-division standing.*

ANRG 150. The Rise and Fall of Ancient Israel (4)
(Previously titled: The Archaeology of Israel in the Iron Age.) The emergence and consolidation of the state in ancient Israel is explored by using archaeological data, Biblical texts, and anthropological theories. The social and economic processes responsible for the rise and collapse of ancient Israel are investigated. *Prerequisite: upper-division standing, ANLD 3 is recommended.*

ANRG 170. Traditional Chinese Society (4)
Course examines major institutions and culture patterns of traditional China, especially as studied through ethnographic sources. Topics include familism, religion, agriculture, social mobility, and personality. *Prerequisite: upper-division standing.*

ANRG 173. Chinese Popular Religion (4)
The religious world of ordinary precommunist times, with some reference to major Chinese religious traditions. *Prerequisite: upper-division standing. Background in pre-modern Chinese history is recommended.*

ANRG 182. Ethnography of Island Southeast Asia (4)
This is an introduction to the diverse cultures of island and peninsular Southeast Asia, including those of Indonesia, the Philippines, and Malaysia. We look at ritual, politics, gender, popular culture, and social change in agrarian and urban societies. *Prerequisite: lower-division anthropology or consent of instructor.*

ANTHROPOLOGY: GRADUATE

ANGR 200. Culture and Social Structure (4)
Culture and social structure are central concepts for understanding behavior but their relationship and joint use present problems which will be examined with the aim of increasing their explanatory power. *Prerequisite: graduate standing.*

ANGR 201. Special Topics in Anthropological Archaeology (4)
Course usually taught by visiting faculty in anthropological archaeology. Course will vary in title and content. When offered, the description and title is found on the current Schedule of Classes on StudentLink, and the anthropology department Web site. (Can be taken a total of four times as topics vary.)

ANGR 219: Seminar in Political Anthropology (4)
The focus here is "politics," broadly constructed, in various societies. Analysis is from the perspective of the resourses deployed by all involved, including but not limited to power, with emphasis on the role of culture and social structure. *Prerequisites: graduate standing*

ANGR 223. Anthropological Interviewing (4)
The course teaches techniques of long-term, intensive interviewing in fieldwork settings with an emphasis on psychodynamic inference and its usefulness in different cultural settings. *Prerequisite: graduate standing in anthropology.*

ANGR 224. Advanced Topics in the Anthropology of Gender (4)
A critical analysis of ethnographic and theoretical texts focusing on the sociocultural study of gender. We will also draw on studies of gender and feminist theory from other disciplines (e.g., history, philosophy) to illuminate issues relevant to anthropology. *Prerequisite: graduate standing in anthropology or permission of instructor.*

ANGR 226. Ethnography of Christianity (4)
Directed to graduate students planning ethnographic work in Christian societies, this course explores variations in the interpretation and expression of Christianity using historical and ethnographic sources. *Prerequisite: graduate standing or consent of instructor.*

ANGR 230. Department Colloquium (1)
A forum to present work by faculty, students, and guests. Course will be offered quarterly. *Prerequisite: graduate standing in anthropology. (S/U grades only.)*

ANGR 231. The Social and Cultural Works of Sigmund Freud (4)
In this seminar we shall examine Freud's works on culture, gender, morality, religion, sex, society, and the arts, and assess their contemporary anthropological relevance. *Prerequisite: graduate standing.*

ANGR 234: Dynamics of Culture (4)
Examination of the actual operation of culture with attention to the importance of cultural Products and social structures. Course goal is to develop skill in understanding the Influence, direct and indirect, of culture and behavior. *Prerequisites: Graduate standing*

ANGR 235. The Anthropology of Modernity (4)
The seminar considers the theorizing of modern society as an anthropological project. Topics include issues of modernity current theory and method, their place in the foundations of anthropology, and prospects for

future work. Lectures and readings change yearly. *Prerequisite: graduate standing.*

ANGR 237: Enduring Issues in Anthropological Theory (4)
The seminar focuses on a number of fundamental issues that have long been at the core of inquiry and explanation in the discipline including the place of the individual in society, the role of values, the effects of group structure, and the ways in which cultures change. *Prerequisite: none.*

ANGR 238. Citizenship and the Nation State (4)
This course examines various conceptions of citizenship, nation, and state and considers their historical development as fundamental to the organization of most contemporary societies. It covers a range of theoretical readings, recent debates, and case studies. *Prerequisite: graduate standing.*

ANGR 239. Person-Centered Ethnography (4)
Person-centered ethnography takes the person as a unit of analysis and description, exploring personal experience in sociocultural context. This course examines selected works in this tradition and assesses the descriptive and theoretical contributions these studies make. *Prerequisite: graduate standing.*

ANGR 251. Ethnographies of Modern Society (4)
This seminar explores the experience and representation of modernity through ethnography. Readings will highlight such issues as: the social dynamics of the city; postcoloniality; globalization and transnationalism; the politics of culture; contemporary religious movements; and gender and modernity. *Prerequisite: graduate standing or permission of the instructor.*

ANGR 253. History of Anthropology (4)
A synoptic treatment of the intellectual currents affecting anthropology during its premodern period, between approximately 1880 and 1940. Coverage will include developments in American, British, and Continental traditions of the discipline. *Prerequisite: graduate standing.*

ANGR 256. Seminar on Brain Evolution (4)
We will review the neural basis of cognition in humans and other primates. Neurobiological findings will be related to contributions from various sub-fields of anthropology. Brain/mind associations will be explored in the context of hominid evolution. *Prerequisite: graduate student in anthropology or consent of instructor.*

ANGR 259. Europeans and Others (4)
Interaction between peoples and powers of Europe and those of Asia, Africa, and the Americas until the end of the colonial epoch. Varying character of the encounter, modes of maintenance of European hegemony, and representations and rationalizations of the process.

ANGR 260. Psychodynamic Anthropology (1)
The focus of the seminar will be on the relation between psychodynamic models and culture and society. Readings and discussion. *Prerequisite: graduate standing. (S/U grades only.)*

ANGR 263. The Anthropology of Language and Discourse (4)
This course emphasizes the importance of linguistic and discursive processes in constituting social relations and systems. We examine different approaches to analyzing this relationship of social and linguistic structures. *Prerequisite: graduate standing.*

ANGR 264. Culture, Power, and the State (4)
This seminar examines distinct theoretical approaches to the contested concepts of culture, power, and the state. We will read fundamental theoretical texts and current ethnographies to examine how cultural beliefs, nationalist ideologies, and ethnic relations shape subjectivities and identities. *Prerequisite: graduate standing.*

ANGR 265. Cultures of Late Capitalism (4)
Radical transformations shifted the boundaries between what is considered political and apolitical, public and private, and legitimate at the turn of the twenty-first century. This class studies how these developments shape and are shaped by local political structures. *Prerequisite: graduate standing.*

ANGR 266: Classics in "Culture and Personality" (4)
This seminar will examine the classic studies of "Culture and Personality," such as Cora DuBois' study of Alor and Gregory Bateson's and Margaret Mead's study of Bali, which laid the foundation for the psychodynamic approach to psychological anthropology. *Prerequisite: graduate standing.*

ANGR 267. The Anthropology of Ethics (4)
This course examines ethical and moral ideas and their relation to other aspects of culture. It also considers how attention to the ethical dogma can provide a foundation for rethinking social scientific theories of culture and practice. *Prerequisite: graduate standing.*

ANGR 268: Anthropology of Cities (4)
Although cities are fundamental sites of emergent social relations and cultural forms, the anthropological study of modern urban society remains problematic. This seminar aims to develop an anthropological understanding of cities, focusing on recent ethnographies, methodological problems, and theoretical debates. *Prerequisite: graduate standing.*

ANGR 269. Current Readings on Latin America (4)
This is a graduate reading seminar focusing on new anthropological works about Latin America. We will cover a wide range of critical current issues, including poverty, the state, gender, race/ethnicity, indigenous politics, memory, and violence. *Prerequisite: graduate standing.*

ANGR 270A-B-C. Psychiatry and Anthropology (0-4)
Introduction to interviewing and diagnostic techniques in psychiatry and their application to anthropological research. Content will vary from quarter to quarter. Students must begin the program in the fall quarter. (Fall and winter, S/U grades only. Spring quarter S/U optional.) *Prerequisites: graduate standing in anthropology and consent of instructor.*

ANGR 273: General Theory (4)
This seminar will be concerned with theories that attempt to construct an integrated account of personality, culture, and society, and how such general theories can be applied to the modern world. Classic and current theorists of modernization will be examined.

ANGR 274. Debates in Anthropology (4)
This seminar will review a series of current or recent significant debates in anthropology. The debates will be examined in the light of their substantive, theoretical, and epistemological implications, with some attention to the rhetorical elements of the arguments themselves. *Prerequisite: graduate student in anthropology.*

ANGR 278. Evolutionary Perspective on Cognition (4)
This seminar examines key issues in (human and nonhuman) primate cognition using perspectives from primate behavior, cognitive ethology, primate and human evolution, and human cognitive science. Topics include tool use, imitation, language, culture, tertiary relations, theory of mind, and models of mind. *Prerequisite: open to graduate students in anthropology and other departments and to advanced undergraduates with instructor's approval.*

ANGR 279. Special Topics in Language and Society (4)
Selected topics in the anthropology of language, such as linguistic ideology, language and identity, multilingualism, discourse analysis. Topics will vary from year to year, and the course may be repeated with instructor's permission. *Prerequisite: graduate standing.*

ANGR 280A: Core Seminar in Social Anthropology (4)
First-year core seminar focuses on individual action and social institutions. *Prerequisite: first-year graduate student in anthropology.*

ANGR 280B: Core Seminar in Cultural Anthropology (4)
First-year core seminar focuses on personal consciousness and cultural experience. *Prerequisite: first-year graduate student in anthropology.*

ANGR 280C: Core Seminar in Psychological Anthropology (4)
First-year core seminar focuses on motives, values, cognition, and qualities of personal experience. *Prerequisite: first-year graduate student in anthropology.*

ANGR 280D. Core Seminar in Anthropological Archaeology (4)
(Formerly numbered ANGR 285.) Integral part of the training for graduate students focusing on Anthropological Archaeology. It is one of a set of core anthropology courses available to graduate students; required of first-year anthropological archaeology students but open for students in other sub-fields. *Prerequisite: anthropology graduate students.*

ANGR 280E. Core Seminar in Biological Anthropology (4)
(Formerly numbered ANGR 284.) This seminar will examine the central problems and concepts of biological anthropology, laying the foundation for first-year graduate students in Biological Anthropology as well as providing an overview of the field for graduate students in other areas of anthropology. *Prerequisite: graduate standing in anthropology.*

ANGR 280F. Integrated Core Seminar (4)
(Formerly numbered ANGR 282.) Two faculty members from different sub fields (sociocultural, anthropological archaeology, and biological anthropology) address issues of mutual interest, illustrating areas of overlap between the aspects of anthropology. *Prerequisite: required core seminar for first year anthropology graduate students.*

ANGR 281A-B. Introductory Seminar (1)
These seminars are held in the first two quarters of the first year of graduate study. Faculty members will present an account of their current research and interests. When appropriate a short preliminary reading list will be given for the particular lecture. *Prerequisite: first-year graduate standing in anthropology.*

ANGR 283A. Fieldwork Seminar (4)
A seminar given to acquaint students with the techniques and problems of fieldwork. Students carry out ethnographic field research in a local community group under faculty supervision. *Prerequisite: anthropology graduate students or consent of instructor.*

ANGR 286. Topics in Anthropological Archaelogy (4)
Seminar examines the central problems and concepts of archaeological anthropology, laying the foundation for first-year graduate students. Also provides an overview of the field in other areas of archaeology. Entire anthropological archaeology faculty and graduate students participate. *Prerequisite: graduate standing in anthropology.*

ANGR 287. Human Biology and Social Policy (4)
Several important issues relate to social interpretations of human biological variation (e.g., race, sex, sexual orientation), putative universals (e.g., violence), and origins (creation or evolution). Seminar explores the thesis that biosocially trained anthropologists can contribute to educating people about these debates. *Prerequisite: graduate standing in anthropology.*

ANGR 293. Primate Socioecology (4)
Course examines theories for the causes of sociality in primates. Implications for our understanding of human evolution are considered. *Prerequisite: graduate standing or permission of instructor.*

ANGR 295. Master's Thesis Preparation (1-12)
The student will work on the master's thesis under the direction of the departmental committee chair. The course will be taken in the student's second year. *Prerequisites: graduate student in anthropology and permission of master's thesis chair.* (S/U grades only.)

ANGR 296A. Fieldwork Proposal Preparation (4)
The student will work in cooperation with his or her departmental committee to develop a research proposal for the doctoral research project. *Prerequisites: graduate standing in anthropology and permission of departmental committee chair.* (S/U grades only.)

ANGR 296B. Fieldwork Proposal Preparation (4)
The student will work in cooperation with his or her departmental committee to develop a research proposal for the doctoral research project. *Prerequisites: advanced graduate standing in anthropology and permission of departmental committee chair.* (S/U grades only.)

ANGR 297. Research Practicum (1-4)
Supervised advanced research studies with individual topics to be selected according to the student's special interests. *Prerequisite: for anthropology graduate students who have returned from their field research.* (S/U grades permitted.)

ANGR 298. Independent Study (1-4)
Supervised study of individually selected anthropological topics under the direction of a member of the faculty. *Prerequisite: graduate standing.* (S/U grades only.)

ANGR 299. Dissertation Research (1-12)
Prerequisite: Ph.D. candidacy in anthropology. (S/U grades only.)

ANGR 500. Apprentice Teaching (4)
Anthropology graduate students participate in the undergraduate teaching program during one quarter anytime in the first four years of residence. Teaching may be in the anthropology department or other departments or programs on campus. Equivalent to duties expected of a 50 percent T.A. Enrollment in four units documents the Ph.D. requirement. (S/U grades only.) *Prerequisite: graduate student in anthropology.*

ANGR 501. T.A.ing in Sixth College/C.A.T. (4 or 6)
Consideration and development of pedagogical methods appropriate to undergraduate teaching in the interdisciplinary Sixth College Core Sequence, Culture, Art, and Technology under supervision of Core Program faculty, with assistance of the Core Program director, associate director for the Writing Program and the associate director of the Thematic program. (S/U grades only.) *Prerequisite: Anthropology graduate student teaching for the C.A.T./Sixth College Writing Program.*

Applied Mechanics and Engineering Sciences (AMES)

See Engineering, School of. Program name changed to *Mechanical and Aerospace Engineering (MAE).*

Applied Ocean Science

OFFICE: 22 Old Scripps Bldg., Scripps Institution of Oceanography

ASSOCIATED FACULTY

Professors

Laurence Armi, Ph.D., *SIO; IGPP*
Michael J. Buckingham, Ph.D., *SIO; MPL*
LeRoy M. Dorman, Ph.D., *SIO; GRD*
Carl H. Gibson, Ph.D., *MAE; SIO*
Robert T. Guza, Ph.D., *SIO; IOD*
John A. Hildebrand, Ph.D., *SIO; GRD; MPL; ECE*
William S. Hodgkiss, Ph.D., *SIO; MPL; ECE*
William A. Kuperman, Ph.D., *SIO; MPL*
Juan C. Lasheras, Ph.D., *MAE*
Paul F. Linden, Ph.D., *MAE*
W. Kendall Melville, Ph.D., *SIO; MPL*
Robert Pinkel, Ph.D., *SIO; MPL*
Sutanu Sarkar, Ph.D., *MAE*
Richard C.J. Somerville, Ph.D., *SIO; CRD*
Dariusz Stramski, Ph.D., *SIO; MPL*
Bradley T. Werner, Ph.D., *SIO; IGPP*
Clinton D. Winant, Ph.D., *SIO; IOD*

Professors Emeritus

Hugh Bradner, Ph.D., *MAE; IGPP*
Douglas L. Inman, Ph.D., *SIO; IOD*
George G. Shor, Jr., Ph.D., *SIO; MPL*
Fred N. Spiess, Ph.D., *SIO; MPL*
Kenneth M. Watson, Ph.D., *SIO; MPL*

Associate Professors

Colm P. Caufield, Ph.D., *MAE*
Keiko K. Nomura Ph.D., *MAE*

Lecturers

Edward P. Dever, Ph.D., *SIO; IOD*
Jules S. Jaffe, Ph.D., *SIO; MPL*
John L. Largier, Ph.D., *SIO; IOD*

Associated Research Groups

Marine Physical Laboratory, *MPL*
Institute of Geophysics and Planetary Physics, *IGPP*
Geosciences Research Division, *GRD*
Integrative Oceanography Division, *IOD*
Climate Research Division, *CRD*

The Graduate Program

Applied Ocean Science (AOS) is an interdepartmental Ph.D. program with a focus on the interface between ocean exploration and technology. It is administered by an interdepartmental group composed of members of the faculties of cooperating departments: the Graduate Department of the Scripps Institution of Oceanography (SIO), the Department of Mechanical and Aerospace Engineering (MAE), the Department of Structural Engineering (SE), and the Department of Electrical and Computer Engineering (ECE).

This interdepartmental curriculum combines the resources of these departments to produce oceanographers who are knowledgeable about modern engineering and instrumentation, as well as marine oriented engineering scientists who are familiar with the oceans. Since physical, chemical, geological, and biological aspects of the oceans and all forms of engineering may be involved, the curriculum provides maximum flexibility in meeting the needs of each individual student.

Candidates for admission should apply directly to one of the departments participating in the Applied Ocean Science program, listing Applied Ocean Science as an area of specialization. The choice of department should be based on the individual student's planned area of major emphasis. Applicants will be expected to meet the admission requirements of the department to which they have applied.

The program is primarily directed toward the Ph.D. degree. However, both the candidate of

philosophy and master of science degree (either Plan I, thesis, or Plan II, comprehensive examination) also will be offered under special circumstances. Students applying for a terminal master's program should be aware of any special requirements for the department to which they apply.

The degrees completed under this program in the Department of SIO will carry the title "Oceanography." Those degrees completed in the other cooperating departments will have the parenthetical title "(Applied Ocean Science)" appended to the appropriate authorized title.

COURSES

All students enrolled in the program are required to take or demonstrate proficiency in the following core courses or their equivalent:

SIO 210 (Physical Oceanography)

SIO 240 (Marine Geology)

SIO 260 (Marine Chemistry)

SIO 280 (Biological Oceanography)

MAE 294A-B-C (Methods in Applied Mechanics) or

Math. 210A-B-C (Mathematical Methods in Physics and Engineering) or

SIO 203A-B-C (Methods of Applied Analysis)

The students are expected to enroll in the Applied Ocean Science Seminar (SIO 208) throughout their period of residency. This seminar will make use of outside speakers, faculty members, and students in presenting various topics on applied ocean science and related fields. It provides a central forum in which all AOS students can participate. In addition to these basic requirements, the student will be subject to whatever additional requirements are prescribed by his or her department.

Course work occupies much of the first one and one-half to two years of graduate study. During this period there are numerous opportunities for students to investigate the research programs of the various research groups on the campus, and cultivate association with professors and research groups which can provide support and guidance for thesis research in their selected field of specialization. In consultation with an adviser, students will plan a curricular path of courses which will adequately prepare them in their field of specialization. The courses may be selected from the entire catalog of courses available on the UCSD campus or where appropriate from other UC campuses and other universities.

Audiology

Joint Doctoral Program between San Diego State University and the University of California, San Diego

DIRECTORS:
Steven J. Kramer, Ph.D., *San Diego State University*
Jeffrey Harris, M.D., Ph.D., *University of California, San Diego*
http://chhs.sdsu.edu/slhs/audmain.php.

Faculty

San Diego State University
Arthur Boothroyd, Ph.D.
Laura Dreisbach, Ph.D.
Steven J. Kramer, Ph.D.
Carol Mackersie, Ph.D.
Radha Simhadri, Ph.D.
Peter Torre, Ph.D.
Derin Wester, Ph.D.

University of California, San Diego
Luis D. Benitez, M.D.
Jeffrey P. Harris M.D., Ph.D.
Elizabeth M. Keithley, Ph.D.
Lina M. Mullen, Ph.D.
Allen F. Ryan, Ph.D.
Erik Viire, M.D., Ph.D.

Professional Doctorate in Audiology (Au.D.)

A professional doctorate in audiology (Au.D.) is offered jointly by San Diego State University (SDSU) and the University of California, San Diego (UCSD). The Au.D. program is a four-year graduate degree program designed for individuals who intend to specialize in clinical practice and to meet professional standards requiring a clinical doctorate as the entry-level degree for a certified audiologist. Graduates of this program will have the knowledge base, research exposure, and advanced clinical skills to enter the workforce in any setting, and will be prepared to function as independent audiology professionals in the expanding health care arena. The program encompasses academic, clinic, and research experiences in audiology and otology, through the combined resources from the Department of Communicative Disorders at SDSU and the Department of Surgery (Otolaryngology) in the School of Medicine at UCSD. More information about the program and admission can be found on the Web site, http://chhs.sdsu.edu/slhs/audmain.php.

Faculty members of the cooperating institutions teach courses, provide clinic instruction and research experiences, and are available as members of joint doctoral committees and advisers for student doctoral projects.

Admissions

Students will apply to the Au.D. Joint Doctoral Program through SDSU. It is expected that students will come into this program from a variety of different science backgrounds, including communicative disorders, biological and physical sciences, engineering, psychology, nursing, or a pre-med curriculum. Applicants for admission to the Au.D. program must meet the general requirements for admission to both universities with classified graduate standing as outlined in the respective catalogs. Applicants must also meet the special requirements of this program. These include (a) overall grade-point average of 3.20 or better in undergraduate courses and in any graduate courses completed; (b) submission of scores on the GRE with satisfactory performance on both quantitative and verbal portions of the examination; (c) prerequisite completion of at least one course in statistics, three courses in biological/physical sciences, two courses in behavioral/social sciences, and one course in American Sign Language. Deficiencies in these areas may be completed after admission to the program if approved by the admissions committee.

Applicants must submit transcripts of all postsecondary coursework, three letters of recommendation from former or current professors, supervisors, or other appropriate persons able to judge their academic potential, and an applicant essay (statement of purpose) indicating their interests and strengths relative to their career objectives. Details of these requirements will be made available with the application form. Assuming that students meet the requirements for admission outlined above, each student admitted to the program will have a program advisor evaluate their preparation in view of their needs and career goals, as well as professional certification requirements.

Applicant files are reviewed as a group by an admissions committee composed of Au.D. program faculty from each campus. Other Au.D. program faculty may review files and make recommendations to the admissions committee. Given the limited number of spaces available (ten new admissions each year are anticipated, subject to available facilities), the admissions committee will select the best-qualified applicants to fill the available spaces. No minimum set of qualifications will guarantee an applicant admission to the program. The admissions committee will make recommendations for admission to the graduate deans from each campus.

Students seeking admission to the Au.D. program should consult the program's Web site or contact the Au.D. program directors for more information, online applications, and application instructions. A complete application requires the following:

appropriate application form

applicant essay (detail provided in application packet)

transcripts of academic work complete.

results of Graduate Record Examination

three letters of recommendation

Students will be admitted to the Au.D. program only in the fall semester (first year is at SDSU). Complete applications must be received by January 20 to be considered for the program beginning in the following fall semester.

Post Master's Degree Admissions: Students admitted to the Au.D. program with a master's degree in audiology will be expected to complete the four-year Au.D. curriculum. However, some students may have had a master's preparation in audiology in which some of the course work was similar to some of the foundation courses in the Au.D. program. Upon entering the program, each individual will be assessed to determine competencies/knowledge in material that would put them on par with expectations for the Au.D. program. For some of the foundation core courses offered the first year at SDSU, e.g., Audiology 705, 710, 725, students may be given credit for the courses or be required to substitute a Doctoral Special Study (Audiology 798) course for one or more of these courses to ensure competencies or remediate deficiencies if approved by the program faculty. Credit for some of the first year clinic units may also be approved based on work experience; however, a full-complement of expected clinical skills must be demonstrated.

REQUIREMENTS FOR THE AU.D. DEGREE

Upon admission to the program, each student will be assigned a faculty adviser. The faculty adviser will help the student select a program of study to meet all program requirements. The Au.D. program is a four-year program, including summer semesters (summer semester between year two and year three may be optional if the requirements are satisfied in other ways). An exact unit minimum is not specified due to the mixing of semester units (SDSU) and quarter units (UCSD) and differences in clinical hours at different settings; however, the program is approximately 134 semester-equivalent course units. All students in the Au.D. program will fulfill the following requirements. Any alternative method of fulfilling these requirements requires advanced written permission from the program directors.

Residency

After formal admission to the Au.D. program, the student must complete a minimum of course hours equivalent to one year's full-time enrollment at each campus. The definition of residence must be in accord with the regulations of San Diego State University and the University of California, San Diego. The program is designed to be shared between the two campuses. The first year is entirely at SDSU, the second year is entirely at UCSD, and the third year will have options from both campuses. The fourth year of the program will be a full-time clinical externship at a program-approved clinic agency or site. Both campuses will share equally in the academic, clinic, and research components of the program.

Courses

The program for each student will consist of prescribed set of courses, with the first year of courses entirely at SDSU and the second year of courses entirely at UCSD. The student's faculty advisor will approve any changes to the standard curriculum.

Clinic

Each student will progress through a variety of clinical experiences involving patient assessment and management throughout their program of study. Clinic experiences will require concurrent enrollment in clinic courses appropriate for the campus in which they are doing the clinical work. These supervised clinical experiences are completed in the SDSU Audiology Clinic, UCSD Otology Clinics, and in community field sites. Clinic courses may be repeated as needed and require adviser approval prior to enrollment. Prior to the fourth year externship, each student will obtain approximately 500 hours of clinic experience. A minimum of 2,000 clinical hours is required by the end of the program.

- *Clerkship in Otology.* All students will have at least one quarter of a clinical rotation with otology staff associated with UCSD. Students will accompany one of the otology faculty during their clinics and receive training in one or more of the following areas—clinical otology, pre-and post-operative assessment of patients, pharmacology related to otology, design and implementation of clinical trials with balance disorders, and pediatric otology.
- *Clinical Staffings.* In addition, all students will be required to regularly participate in formal clinical case study/staffing experiences. At SDSU, these clinical staffings include student and faculty presentations and discussions of interesting cases seen in their clinics. At UCSD, these staffings include, the Chairman's Conference, where Au.D. students/residents and medical staff discuss otological problem cases and disorders and the Neurotology Conference, where UCSD and community physicians, and students/residents discuss cases dealing with neurological diseases and vestibular disorders.
- *Fourth-Year Externship.* The fourth-year externship is a full-time clinical experience in an approved agency/site. These externships may require a competitive interview process by the agency. Externship sites may be in other parts of the country. All students in their fourth-year externship must also enroll in the online clinical seminar at SDSU each semester.

Research Practicum

Each student will spend at least two semesters or quarters participating in research being done by program faculty. Students are encouraged to spend time in two different laboratories (one on each campus) with different methodologies. Students will not be conducting independent research, but will actively participate in data collection and analysis at the discretion of the lab director. Students must enroll in the research practicum course for the appropriate campus.

Examinations

All students in the program will be evaluated at the following levels:

- *First Year.* Students must have achieved a 3.0 grade-point average on all core and elective courses during the first year, and have appropriate clinical skills as determined by the student's clinic supervisors. The student's ability to integrate the academic material and clinic procedures appropriate for the end of the first year will be assessed through a first year qualifying exam. This examination will be a written examination to be taken at the end of the spring semester. The first year qualifying exam may be repeated once following additional directed study by the student's adviser. Students must pass the first year evaluation in order to enroll in second year courses.
- *Second Year.* Students must have achieved a cumulative grade-point average of 3.0 on all core and elective courses, and have appropriate clinical skills as determined by the student's clinic supervisors. The student's ability to integrate the academic and clinic procedures appropriate for the end of the second year will be assessed through a second year qualifying examination. This examination will be a written examination to be taken at the end of the spring semester. The second year qualifying examination may be repeated once following additional directed study by the student's adviser. Students must pass the second year evaluation in order to enroll in third year courses.
- *Comprehensive Examination.* At the end of the third year, and after advancement to candidacy (see below), the student will take a comprehensive examination, which has an integrative written component and a practical component involving clinical procedures. The comprehensive examination must be passed before a student can be registered for the externship.

Advancement to Candidacy

Candidates will be recommended for advancement to candidacy after successfully completing all course, laboratory rotation, and clinic requirements for Year 1 and Year 2 (with a minimum grade-point average of 3.0), satisfactory performance on the first and second year evaluations, and approval of the doctoral project proposal. Students cannot enroll in the doctoral project course, take the comprehensive examination, or register for their externship until advanced to candidacy. The program's executive committee recommends students eligible for advancement to candidacy to the graduate deans of both institutions

Doctoral Project

Each student will complete an innovative doctoral project. The doctoral project can take the form of a number of different options, e.g., a research-based investigation, evidence-based position paper, critical literature review with applications to clinical problem solving, grant proposal, development of a clinical protocol based on published research findings, or other projects proposed by the student that are accepted by the committee. The project should be designed to allow an opportunity to demonstrate critical thinking on clinical issues. Each student will select a doctoral project committee comprised of two Au.D. program faculty (one from each campus) and a faculty member external to the program. The chair of the committee can be from either campus. The executive committee will approve each student's doctoral project committee. All doctoral projects will be written in a format approved by the student's doctoral project committee. The student's final written document will be approved by the student's doctoral project committee. Each student will enroll in the appropriate doctoral project course depending on the campus in which their committee chair resides.

The Doctor of Audiology (Au.D.) degree will be awarded jointly by the Regents of the University of California and the Trustees of The California State University in the names of both cooperating institutions.

Funding for graduate students cannot be guaranteed, although every effort will be made to provide some financial support for as many students as possible, through graduate/teaching assistantships, research grants, clinical traineeships, and/or scholarships. Financial support will be awarded consistent with the policies of the two universities. Tuition and fees will be charged in accordance with the extant policies at the campus in which the student is matriculated in a given year.

COURSES

AUD 236. Neuro-otology Preceptorship (2)
Students observe in UCSD Otology clinics, learning the procedures for taking histories and performing clinical examinations, as well as providing treatment and patient education. *Prerequisites: second-year Au.D. student or consent of instructor.*

AUD 255. Anatomy and Physiology of the Auditory and Vestibular Systems (4)
This course describes the detailed anatomy of the auditory and vestibular systems, from the external ear to the central pathways associated with each system. This includes the ultra-structure, histology and neuronal connections of the systems. In addition, they physiological responses that underlie the actions of each system are described, from the cellular to the systems levels. *Prerequisites: second-year Au.D. student or consent of instructor.*

AUD 256. Pathophysiology of the Auditory and Vestibular Systems (4)
This course describes the known physiological and anatomical substrates of auditory and vestibular disorders. This includes conductive, sensorineural and retrocochlear hearing loss, and peripheral vestibular disorders. Congenital disorders due to genetic causes or infections, as well as acquired ototoxic, noise-induced, infective, autoimmune, age-associated, and traumatic disorders will be described. The influences of neurological disorders upon these two sensory systems will also be covered. *Prerequisites: AUD 255 or consent of instructor.*

AUD 257. Ear Diseases and Treatment (3)
This course describes the differential diagnosis and treatment of auditory and vestibular disorders, audiological components of neuro-otology, as well as interactions between the audiologist and neuro-otologist in a clinical setting. *Prerequisites: second-year Au.D. student or consent of instructor.*

AUD 263. Physiological and Behavioral Tests of Vestibular Function (3)
This course will discuss the clinical evaluation of vestibular function, using techniques such as caloric and rotational electronystagmography and posturography. The interpretation of clinical findings and implications for rehabilitative strategies will be covered. The course will include observation of testing in an otology clinic setting. *Prerequisites: second-year Au.D. student or consent of instructor.*

AUD 264. Auditory and Vestibular Development and Genetics (3)
This course describes the embryology and functional development of the auditory and vestibular systems, from their initial appearance to achievement of adult function. Inherited disorders of these two sensory systems are also addressed, including phenotypic description and, when known, the genetic basis. Genetic counseling and the potential for gene therapy will also be discussed. *Prerequisites: second-year Au.D. student or consent of instructor.*

AUD 270. Newborn Hearing Screening and Management (3)
This course describes procedures and requirements for newborn hearing screening, and the detection and clinical management of congenital auditory disorders. This will include the opportunity to observe newborn screening demonstrations in a neonatal ICU environment. *Prerequisites: second-year Au.D. student or consent of instructor.*

AUD 271. Temporal Bone Anatomy (4)
This course will describe the detailed anatomy of the temporal bone, including surgical approaches. Students will participate in dissecting a human cadaver

temporal bone specimen, and observe medical residents/staff learning to perform surgical drilling of temporal bone under the supervision of experienced otologic surgeons. In addition, radiographic and magnetic resonance imaging of the temporal bone will be described and discussed. *Prerequisites: second- or third-year Au.D. student or consent of instructor.*

AUD 275. Intraoperative Monitoring (3)
This course will detail the methods and procedures required for monitoring of evoked auditory responses in the operating room. The indications for the use of intraoperative monitoring will be covered, as will difficulties that are unique to this setting. The responses of auditory potentials to surgical levels of anesthesia will also be described. The course will include the opportunity to observe auditory potential monitoring in the operating room. *Prerequisites: second- or third-year Au.D. student or consent of instructor.*

AUD 276. Cochlear Implants and Other Implantable Sensory Aids (3)
This course will cover the theory and practice of cochlear implantation. Current concepts regarding the activation of primary auditory neurons by electrical stimulation are discussed. Indications for cochlear implantation and surgical procedures are described. Audiological management of patients after implantation forms the bulk of the material presented. *Prerequisites: second- or third-year Au.D. student or consent of instructor.*

AUD 277. Seminar in Advanced Topics and Research in Audiology (3)
Discussion of advanced topics in audiology and hearing science. Reading and critiquing journal articles and data emerging from research laboratories. *Prerequisites: second-year Au.D. student or consent of instructor.*

AUD 284. Clinical Practice in Audiology II (1-4)
Applications of clinical procedures to patient assessment. Includes clinical observation, interaction with otologists, and supervised patient care involving diagnostics and hearing aid evaluations in the UCSD audiology clinics. This course may be taken more than once. *Prerequisites: open to second- or third-year doctoral students or consent of instructor.* One quarter unit represents 3 to 4 hours per week.

AUD 291. Clinical Case Studies/Staffing (1)
Presentations and discussion of clinical cases and issues related to clinical practice. Students' clinical experiences are discussed relative to medical and audiological assessment and management. This course may be taken more than once. *Prerequisite: second-year Au.D. student or consent of instructor. Must be taken concurrently with AUD 284.*

AUD 296. Independent Research (1-4)
Independent research on topics relevant to audiology, consisting of literature review, data collection. Faculty supervision and mentoring on practical elements of research design and methodology. *Prerequisite: consent of instructor.*

AUD 301. Doctoral Project (3)
Individual investigation and preparation of the doctoral project for the Au.D. degree will be performed under the supervision of an experienced research mentor. This course may be taken more than once. *Prerequisite: advancement to candidacy.*

Biochemistry

Students wishing to major in biochemistry should refer to programs offered by the Division of Biological Sciences, which has an undergraduate major in biochemistry and cell biology, or the Department of Chemistry and Biochemistry, which has an undergraduate major in biochemistry/chemistry.

Both the Division of Biological Sciences and the Department of Chemistry and Biochemistry offer graduate programs with specialization in biochemistry. Those programs are described in the biological sciences and chemistry and biochemistry sections of this catalog.

Bioengineering

See Engineering, School of.

Bioinformatics

The explosion in biological knowledge spawned by various genome projects has created entirely new fields and industries, and a need for a new cadre of trained computational biologists who are familiar with biology, mathematics, chemistry, and computer sciences. A new interdisciplinary undergraduate major has been created beginning in fall 2001 leading to B.S. degrees with a major or specialization in bioinformatics. The major involves the Division of Biology and the Departments of Bioengineering, Chemistry and Biochemistry, and Computer Science and Engineering as well as researchers at the San Diego Supercomputer Center. This major is designed to provide career opportunities for B.S. graduates, as well as opportunities for future advanced training at the graduate level. Bioinformatics will have a tremendous impact upon our understanding of cellular functions, protein structure and design, evolutionary biology, regulatory networks, and the molecular basis of disease.

Admissions

Students wishing to pursue a study in bioinformatics may select from majors offered by the Division of Biology, or the Departments of Bioengineering, Chemistry and Biochemistry, and Computer Science and Engineering. A major in bioinformatics is available within each of the listed departments and divisions. All the participating departments have a substantially common curriculum, but each has its own emphasis through its electives, and there are some differences in the core requirements. There is a limited number of seats available campuswide and admission into the bioinformatics premajor and major will be based on academic excellence and preparation as measured by GPA and a written statement. Currently, the combined number of premajors is limited to 75 and the number of majors is limited to 50. These limits may change from time to time. The major, its specific requirements, and the screening criteria are listed in the corresponding catalog sections of the Division of Biology, Department of Bioengineering, Department of Chemistry and Biochemistry, and Department of Computer Science and Engineering.

Bioinformatics Graduate Program

PROGRAM DIRECTOR:
Shankar Subramaniam
Professor of Bioengineering and Chemistry and Biochemistry
Senior Fellow, San Diego Supercomputer Center

STUDENT AFFAIRS: (858) 822-4948
bioinfo@ucsd.edu
http:///www.bioinformatics.ucsd.edu

Participating Faculty

Department of Bioengineering

Sangeeta Bhatia, *Associate Professor*
Jeffrey Hasty, *Assistant Professor*
Xiaohua Huang, *Assistant Professor*
Gary Huber, *Assistant Professor*
Trey Ideker, *Assistant Professor*
Andrew McCulloch, *Professor*
Bernhard Palsson, *Professor*
Shankar Subramaniam, *Professor*

Division of Biological Sciences

Russell Doolittle, *Professor Emeritus, Molecular Biology*
Michael Gribskov, *Associate Adjunct Professor*
John Huelsenbeck, *Associate Professor, Ecology, Behavior and Evolution*
William Loomis, *Professor, Cell and Developmental Biology*
Eduardo Macagno, *Atkinson Chair, Professor, Cell and Developmental Biology, Dean*
William McGinnis, *Professor, Cell and Developmental Biology*
James Posakony, *Professor, Cell and Developmental Biology*
Milton Saier, *Professor, Molecular Biology*
William Schafer, *Associate Professor, Neurobiology*
Julian Schroeder, *Professor, Cell and Developmental Biology*
Douglas Smith, *Professor Emeritus, Molecular Biology*
Suresh Subramani, *Professor, Molecular Biology*
Steven Wasserman, *Professor, Cell and Developmental Biology*

Biomedical Sciences Program

Joseph Adams, *Associate Professor, Pharmacology*
Philip Bourne, *Professor, Pharmacology*
Lawrence Goldstein, *Professor, Cellular and Molecular Medicine/Pharmacology*
Bing Ren, *Assistant Professor, Cellular and Molecular Medicine*
Palmer Taylor, *Professor/Dean, School of Pharmacy and Pharmaceutical Sciences*
Lynn Ten Eyck, *Adjunct Professor, Pharmacology*
Ron Thomas, *Professor, Family and Preventive Medicine*
Roger Tsien, *Professor, Pharmacology*
Robert Tukey, *Professor, Pharmacology*

Department of Chemistry and Biochemistry

Alexander Hoffmann, *Assistant Professor*
Patricia Jennings, *Professor*
Simpson Joseph, *Assistant Professor*
Elizabeth Komives, *Professor*
Andrew McCammon, *Professor*
Susan Taylor, *Professor*
Peter Van der Geer, *Assistant Professor*
Wei Wang, *Assistant Professor*
Peter Wolynes, *Professor*
John Wooley, *Adjunct Professor*

Department of Cognitive Science

Richard Belew, *Professor*

Department of Computer Science and Engineering

Scott B. Baden, *Professor*
Vineet Bafna, *Professor*
Larry Carter, *Professor*
Garrison Cottrell, *Professor*
Charles Elkan, *Associate Professor*
Pavel Pevzner, *Ronald R. Taylor Chair and Professor*
J. Benjamin Rosen, *Adjunct Professor*

Department of Medicine

Michael E. Baker, *Research Scientist*

Department of Mathematics

Ian Abramson, *Professor*
Michael Holst, *Professor*
John O'Quigley, *Professor Emeritus*
Jeffery Remmel, *Professor*
Glenn Tesler, *Assistant Professor*
Ruth Williams, *Professor*

Department of Physics

Terence Hwa, *Professor*
Herbert Levine, *Professor*
José Onuchic, *Professor*

Department of Psychiatry

Nicholas Schork, *Professor*

Program Focus

The Interdisciplinary Bioinformatics Graduate Program draws upon the expertise of affiliated faculty from the Division of Biological Sciences; Departments of Bioengineering, Chemistry and Biochemistry, Computer Science and Engineering, Mathematics, Physics, and Psychiatry; the Biomedical Sciences Graduate Program.

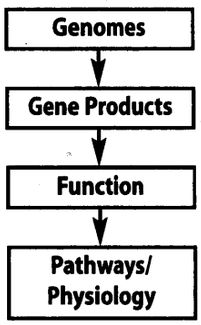
The University of California, San Diego is a premier research institution that has fostered interdisciplinary research since its inception. Specifically, bioengineering (at the interface of biology, medicine, and engineering), neuroscience (at the interface of biology and medicine), biophysics (at the interface of chemistry, biology, and physics), and cognitive science (at the interface of medicine and computer science) are all nationally ranked interdisciplinary graduate research programs. This has led to growth and innovation in many new areas of science and engineering research and the training of an exceptionally high caliber of graduate and postdoctoral students.

In recent years, bioinformatics has been identified by the UCSD administration as one of the most important growth areas for the campus. Several recent new faculty hires have been targeted in bioinformatics-related fields. UCSD has also seen a significant increase in the research activity associated with bioinformatics across the traditional disciplines.

Development of the Field and Departmental Strength in the Field

We are witnessing the birth of a new era in biology. The ability to decipher the genetic code of living organisms is dramatically changing our understanding of the natural world and promises to improve substantially the quality of human life. Recent advances in technology have led to the creation of a new interdisciplinary science—genomics. In simple terms, genomics is the reading and understanding of the blueprints for life. Understanding how genomes work requires sophisticated computer-based information handling tools *(bioinformatics)*, and new high throughput technologies for understanding the function of genes on a genome-wide scale *(functional genomics)*.

Bioinformatics characterizes the flow of information in living systems and can be schematically represented by the following:



The most pressing problem in the post-genome sequencing era will be to understand the integrated functions of thousands of genes. Dealing with this problem will require an interdisciplinary research structure dedicated to developing intellectual and human capital in bioinformatics and genome science. Due to the complexity of this new paradigm in biology, i.e., understanding the organization, evolution, and function of whole genomes rather than single genes, entirely new sets of tools and human resources will be necessary. Thus, future developments in genomics, and the applications that

derive from genomics, will be dependent upon the scientific progress at the interface of three major disciplines—biology, engineering, and computer science. In addition to the scientific advances required to understand the functions of genomes, the accelerated growth of modern biology warrants revolutionary changes in academic curricula.

Each department represented in this program participates in various interdisciplinary graduate programs in addition to providing very strong intradisciplinary graduate training. One example is the La Jolla Interfaces in Science program (LJIS), a campus- and mesa-wide fellowship opportunity sponsored by the Burroughs Wellcome Fund. LJIS supports exploration of interfaces between the biological and biomedical sciences and the physical, computer, and mathematical sciences at UCSD, The Scripps Research Institute (TSRI), the Salk Institute, and the San Diego Supercomputer Center.

Bioengineering, consistently ranked among the top three programs nationally by *U.S. News and World Report*, has several new faculty hires in the area of bioinformatics and computational biology and has identified bioinformatics as a major area of focus.

Biological Sciences, a premier division at UCSD, will spearhead the interdisciplinary, undergraduate specialization in bioinformatics and is planning to hire new faculty in bioinformatics fields.

Biomedical Sciences, is an interdisciplinary Ph.D. program, based in the School of Medicine, with tracks in pharmacology, physiology, and cellular and molecular medicine. It will be closely linked to the planned new School of Pharmacy and Pharmaceutical Sciences. In addition to a strong computational biology presence amongst its faculty, there are plans to hire more faculty whose main interests are in computational pharmacogenomics and bioinformatics.

Chemistry and Biochemistry, the home of the Molecular Biophysics Training Grant, is highly recognized for its strong computational biology program with plans to further expand in chemo and bioinformatics areas.

Computer Science and Engineering is unique in having a critical mass of faculty whose research interests focus on biology. These faculty have very strong collaborative research interactions with biology, chemistry, and engineering researchers. CSE is currently recruiting for a senior faculty member with computational biology expertise.

Mathematics has expressed strong interest in building in the area of bioinformatics with emphasis on statistics and probability. This focus is one of fundamental importance for the future of bioinformatics, and the department is committed to both hiring new faculty and launching new courses in statistics pertinent to bioinformatics.

Physics is the home of leaders in the field of computational statistical mechanics applied to biology and provides the foundation for sophisticated modeling of complex biological systems. Physics also plans to recruit new faculty members whose research focus will be on development of information/theory-based models of biological systems.

Admissions Requirements

Admission is in accordance with the general requirements of the graduate division. Candidates will have an interdisciplinary persuasion to work across computers, biology, medicine, and engineering; with an undergraduate degree majoring in any of the disciplines in biological science, physical science, computer science, mathematics, or engineering with a strong background in quantitative sciences and biology.

Admission review will be on a competitive basis based on the applicants' undergraduate track record, Graduate Record Examination General Test (GRE) scores, and other scholastic achievements. Attention will also be given to the motivation and career plans of the applicant candidates. Special attention will be given to the quantitative and analytical section scores of the GRE. The applications will be screened and evaluated by the Admissions Committee with input from all program faculty. In addition, applicants must submit a completed UCSD Application for Graduate Admission (use major code BF75), official transcripts (English translation must accompany official transcript written in other languages), TOEFL scores (required ONLY for all international applicants whose native language is not English and whose undergraduate education was conducted in a language other than English), and three letters of recommendation from individuals who can attest to the academic competence and to the depth of the candidates' interest in pursuing graduate study.

Acceptance letters to incoming students will indicate academic areas in which the Admissions Committee believe the individual is deficient and suggestions for remedial materials to be examined prior to the fall quarter may be provided.

For further admission information and/or to request an application packet, students should contact the bioinformatics graduate coordinator via email at bioinfo@ucsd.edu or at (858) 822-4948. You may also visit our Web site at http:///www.bioinformatics.ucsd.edu.

Foreign Language Requirement

Competence in one or more foreign languages is encouraged but not required.

Curriculum

Specific fields of emphasis:

- biological data and analysis tools
- sequence analysis
- genomic analysis
- statistical methods for bioinformatics

The Interdisciplinary Bioinformatics Graduate Program is organized around a formal course requirement consisting of three quarters of course work, with enrollment in four four-unit courses each quarter. One four-unit course in each quarter will be a research rotation in the laboratory of a program faculty mentor. The remaining nine courses will include four compulsory core courses and five courses to be chosen from a list of electives approved by the Course Committee.

The electives are intended to maximize the flexibility of the program, but at least one course must be chosen from the biology field and one from the computer science and engineering field. The faculty adviser(s) will pay particular attention to deficits in the background of each student and will assist in making appropriate course choices from the elective fields. Students electing to take any of the undergraduate courses listed in these fields will receive an additional course component in order to make it equivalent to a graduate level course. Students have the option to test out of a field by passing an exam designed by the faculty committee. This exam will fulfill one of the breadth requirements of the program.

It is the general policy of the program to be as adaptable as possible to the needs of the individual student. The faculty advisory committee will work closely with students to identify what might be lacking in a particular curriculum program.

Core Training Courses

- Bioinformatics I: Biological Data and Analysis Tools (Pharm 201)
- Bioinformatics II: Sequence and Structure Analysis—Methods and Applications (BENG 202/CSE 257A)
- Bioinformatics III: Genomic Analysis (BENG 203)
- Bioinformatics IV: Statistical Methods in Bioinformatics (Math 283)

PROGRAM ELECTIVES

(Each student will select from five of the eight elective fields below. One must be from the biology field and one from the computer science field. For each elective, multiple course options currently available are listed).

Elective 1: Biochemistry

BENG 230:	Biochemistry
BIBC 100:	Structural Biochemistry
CHEM 114A:	Biochemical Structure and Function
CHEM 213:	Chemistry of Macromolecules
CHEM 218:	Macromolecular Biochemistry

Elective 2: Data Structures

CSE 100:	Data Structures
CSE 200:	Computability and Complexity
Math 176A:	Computer Implementation of Data Structures

Elective 3: Algorithms

CSE 101:	(also Math 188) Design and Analysis of Algorithms
Math 173:	Mathematical Software Scientific Programming

Elective 4: Information Retrieval, Databases and Data Mining

CSE 132A:	Database System Principles
CSE 133:	Information Retrieval
CSE 254:	Machine Learning

Elective 5: Molecular Genetics

BICD 100:	Genetics
BIMM 100:	Molecular Biology
BIBC 116:	Evolution of Genes and Proteins
BGGN 220:	Advanced Molecular Biology
BGGN 223:	Advanced Genetics

Elective 6: Cell Biology

BICD 110:	Cell Biology
BICD 130:	Embryos, Genes, and Development
BIOMED 210:	Cellular Biology
BIOMED 212:	Cellular and Molecular Pharmacology
BGGN 222:	Advanced Cell Biology

Elective 7: Physics and Engineering

BENG 253:	Biomedical Transport Phenomena
BENG 275:	Computational Biomechanics
PHYS 210A:	Equilibrium Statistical Mechanics or higher

Elective 8: Mathematics and Statistics

Math 174:	Numerical Methods in Science and Engineering
Math 181E:	Mathematical Statistics
Math 280A:	Probability Theory

EXAMPLE 1–SAMPLE PROGRAM (YEAR 1)

A student with an undergraduate background in biology might make the following course selections:

YEAR 1

FALL	WINTER	SPRING
Bioinformatics I	Bioinformatics II	Bioinformatics III Bioinformatics IV
	CSE 100	CSE 101
Test out– Chem. 114A	BENG 275	Test out– BICD 110
Elective	Elective	Elective
	Research Rotation	Research Rotation

EXAMPLE 2–SAMPLE PROGRAM (YEAR 1)

A sample program for a student with an undergraduate degree in computer science and engineering might be structured as follows:

YEAR 1

FALL	WINTER	SPRING
Bioinformatics I	Bioinformatics II	Bioinformatics III Bioinformatics IV
	BIOMED 210	Chem. 213
Test out – CSE 101	Math 280A	Elective
Elective	Elective	Test out – CSE 132A
	Research Rotation	Research Rotation

YEAR 2

All students, regardless of their background and elective track, will be expected to begin working in the laboratory of their choice by the second year. Additionally in Year 2, students will begin preparing for their qualifying examination and will participate in advanced seminar courses and journal clubs identified by program faculty.

End of Year 2 through 5

Spring of Year 2: Qualifying Examination

Spring of Year 3: Advance to Candidacy

End of Year 5: Ph.D.

In summary, in addition to three quarters of research rotations, students must complete the four compulsory bioinformatics core courses; and, either test out of, or select at least five courses from the eight elective areas.

Research Rotations

Each student in the graduate program will participate in three research rotations, at least two of which will be in the laboratory of mentors other than the thesis directors. The purpose of the research rotation will be to train the students in research methodology in specific bioinformatics areas. At the end of the research rotation period, the student will submit a written report that will be evaluated by the faculty mentor in whose laboratory the project was carried out. The report will also be sent to the Qualifying Examination Committee who will take this into consideration in the assessment of the student for admission to candidacy.

Seminars, Informal Courses, Group Meetings, and Symposia

As well as formally structured courses and research rotations, graduate students will have access to seminars, group meetings, and informal sessions during which they will have frequent opportunities to interact closely with faculty mentors and to present their research plans, problems, and findings. In addition to weekly bioinformatics seminars, the graduate program will launch monthly student/faculty meetings at which students can present their research findings and discuss their progress. Graduate students will also be expected to organize an annual symposium where they will invite leading researchers to UCSD for one-day talks and discussions.

Besides the activities noted above, UCSD as a premier research institution has many excellent seminar programs sponsored by each research department and organized research group. Several interdisciplinary programs facilitate research

meetings. Notable ones include the La Jolla Interfaces in Sciences (LJIS) Program, the Neurosciences Program, the Molecular Biophysics Program, the Whitaker Institute for Biomedical Engineering, the San Diego Supercomputer Center, and the Structural Genomics Program. LJIS, for example, is an extremely successful interdisciplinary program sponsoring stimulating and state-of-the-art seminars. LJIS recently sponsored a well- received symposium on Post-Genomic Bioinformatics. Many program faculty are involved in several of the areas mentioned above, and the bioinformatics graduate program benefits from all of these additional programs and symposia.

Research Training

Students, upon completion of the appropriate course work, will be given research orientation lectures by the bioinformatics program faculty. Each graduate student will participate in a research experience in the laboratory he or she selects to carry out the research rotation. During this period students will become acquainted with scientific methodology for designing experiments, analyzing the results, organizing the data, conducting research in a responsible manner, preparing oral and poster presentations of research results, and writing scientific papers.

Upon successful completion of the Qualifying Examination (described in the following section), graduate students will choose their research project from the many possibilities offered in the program and begin to work on a research problem with their faculty advisers. In consultation with their mentors, students will formulate the research activity that will lead to their dissertation. Graduate students will have the opportunity to do internships in the local bioinformatics/biotechnology industry if the thesis project is of mutual interest to a corporate sponsor and the thesis advisers. The research program is designed with two key objectives in mind: (1) to provide a truly interdisciplinary research training at the interface area between biology and computer science and engineering; and (2) to address fundamentally strong research problems that will lead to the advancement of the field of bioinformatics. We anticipate that every graduating student will emerge as a highly trained bioinformatician who can either pursue an academic career by choosing optimal postdoctoral research positions or enter the next generation biotechnology/biopharmaceutical industry.

It is our belief that active research under proper tutelage is the best means of training and that the foundations of a good graduate training program rest on an outstanding faculty group, an excellent student body, and a strong and well-coordinated research program. Each of the faculty members in this program has expertise and interests that will contribute importantly to the Interdisciplinary Bioinformatics Graduate Program. Participating faculty have pooled their resources in terms of laboratories, and the knowledge and experience to ensure the success of the program. Through daily contact with faculty and other research colleagues, students will learn to develop critical and creative thinking skills, scientific methodology, and a sound knowledge of research problems.

Advancement to Ph.D. Candidacy

Upon completion of formal course requirements, each student will be required to take a written and oral qualifying examination that will admit the student to the candidacy of the Ph.D. program. In advance of the qualifying examination, each student, in consultation with his or her faculty adviser(s), will establish a dissertation committee of five faculty members. The committee will consist of three faculty, at least two of whom are affiliated with the bioinformatics program, and two other faculty from departments affiliated with the program, or who are themselves members of the program faculty. At least one of the two other committee members must be tenured. The thesis advisers will have the major responsibility for the student's research and dissertation.

It is anticipated that each student will complete the qualifying examination before the end of the second year of his or her tenure, but no later than the end of the third year. The student is expected to join a research laboratory for completing a thesis dissertation no later than the beginning of the second year of tenure.

Thesis and/or Dissertation

Each graduate student in the program will work on a bioinformatics thesis project under dual mentorship of the program faculty. As a partial fulfillment for the Ph.D. degree, the student will submit a complete dissertation to be evaluated by a doctoral committee chosen by his or her mentors in consultation with the bioinformatics steering committee. The doctoral dissertation will be submitted to each member of the doctoral committee at least four weeks before the final examination. The student will defend his or her final thesis after the committee's evaluation and will pass or fail depending on the committee's decision. The entire graduate program is expected to be completed within the proposed timeline of the program.

Final Examination

Bioinformatics graduate students will defend their thesis in a final oral examination. The exam will consist of (1) a presentation of the thesis by the graduate student, (2) questioning by the general audience, and (3) closed door questioning by the thesis committee. The student will be informed of the exam result at the completion of all three parts of the oral examination. The final report of the doctoral committee will be signed by all members of the committee and the final version of the dissertation will conform to the procedures outlined in the publication, *Instructions for the Preparation and Submission of Doctoral and Master's Theses*.

Teaching Requirement

Each graduate student admitted to the Ph.D. program in bioinformatics is mandated to serve as a teaching assistant (TA) for at least two quarters. This will aid in preparing the students for a teaching career. In addition, each student will make periodic research presentations to the graduate program students/faculty. Students will also discuss their progress at the annual program meeting to be held each year. It is anticipated these formal presentations will serve as valuable training in preparing the student for a teaching career.

Bioinformatics graduate students will also participate in additional TA training provided by the Office of Graduate Studies and Research through the Center for Teaching Development (CTD).

Financial Support

It is expected that all students admitted into the Ph.D. program in bioinformatics will receive financial assistance subject to their continuance and performance in the program. The assistance will be provided from (1) departmental financial commitments, (2) university financial commitments, (3) teaching assistantships, (4) research assistantships, and (5) NIH-funded graduate training grant.

Employment Prospects

There is enormous demand from industry for trained professionals in bioinformatics. The pharmaceutical industry, agrobusiness, and biotechnology companies often look to academia for people with the appropriate interdisciplinary skills. There is also a great need for academic faculty who have broad, interdisciplinary training, because much of the success of the next generation of undergraduate and graduate students will depend on their ability to master materials in several disciplines. Competition for people skilled in bioinformatics is so intense that salary offers are being driven sky-high and there is concern that the universities—few of which are training students in the field—are rapidly being depleted of the best researchers.

A report from the Working Group of Biomedical Computing of the NIH recognized the shortage of biologists with appropriate computing expertise and called for strong NIH support of cross-disciplinary education and training.

Ph.D. Degrees with a Specialization in Bioinformatics

Currently, UCSD offers Ph.D. degrees with a specialization in bioinformatics from the participating departments listed in this section. Students are admitted into one of the departmental graduate programs and satisfy the requirements of both the departmental and the interdisciplinary bioinformatics graduate program. If you are interested in the Ph.D. degree with a specialization in bioinformatics, please consult with the Student Affairs Office of the department you are interested in to obtain further information on admission and individual program requirements.

Further Information

For further information please visit our Web site at http:///www.bioinformatics.ucsd.edu, or contact the bioinformatics student affairs office at (858) 822-4948, bioinfo@ucsd.edu.

Biological Sciences, Division of

STUDENT AFFAIRS OFFICE
1128 Pacific Hall
(858) 534-0557

FINANCIAL AND ADMINISTRATIVE OFFICES
1610 Urey Hall, Revelle College

http://www-biology.ucsd.edu/

Professors

Darwin K. Berg, Ph.D.
Ethan Bier, Ph.D.
Jack W. Bradbury, Ph.D., *Emeritus*
Stuart Brody, Ph.D.
Ted J. Case, Ph.D.
Lin Chao, Ph.D.
Maarten J. Chrispeels, Ph.D.
Nigel M. Crawford, Ph.D.
Russell F. Doolittle, Ph.D., *Research Professor*
Richard W. Dutton, Ph.D., *Emeritus*
Richard A. Firtel, Ph.D., *Chair, Cell and Developmental Biology Section*
Douglass J. Forbes, Ph.D.
E. Peter Geiduschek, Ph.D., *Research Professor*
Anirvan Ghosh, Ph.D.
Michael E. Gilpin, Ph.D., *Emeritus*
Melvin H. Green, Ph.D., *Emeritus*
Stephen M. Hedrick, Ph.D.
Donald R. Helinski, Ph.D., *Research Professor*
John J. Holland, Ph.D., *Emeritus*
James T. Kadonaga, Ph.D., *Chair, Molecular Biology Section*
William B. Kristan, Jr., Ph.D., *Chair, Neurobiology Section*
Russell S. Lande, Ph.D.
Dan L. Lindsley, Ph.D., *Research Professor*
William F. Loomis, Jr., Ph.D.
Eduardo R. Macagno, Ph.D., *Dean, Richard C. Atkinson Endowed Chair*
Vivek Malhotra, Ph.D.
William J. McGinnis, Ph.D.
Stanley E. Mills, Ph.D., *Emeritus*
S. Mauricio Montal, M.D., Ph.D.
Cornelis Murre, Ph.D.
John W. Newport, Ph.D.
Xuong Nguyen-Huu, Ph.D.
Lorraine Pillus, Ph.D.
James W. Posakony, Ph.D.
Paul A. Price, Ph.D., *Academic Senate Distinguished Teaching Award*
Milton H. Saier, Ph.D.
Immo E. Scheffler, Ph.D., *Academic Senate Distinguished Teaching Award, Chancellor's Associates Award for Excellence in Teaching, Paul D. Saltman Professor of Science Endowed Chair*
Robert J. Schmidt, Ph.D.
Julian I. Schroeder, Ph.D., *Novartis Endowed Chair in Plant Sciences*
Terrence J. Sejnowski, Ph.D.
Allen I. Selverston, Ph.D., *Emeritus*
S. Jonathan Singer, Ph.D., *Research Professor/ University Professor Emeritus*
Douglas W. Smith, Ph.D., *Emeritus*
Deborah H. Spector, Ph.D.
Nicholas C. Spitzer, Ph.D.
Suresh Subramani, Ph.D.
Kiyoteru Tokuyasu, Ph.D., *Emeritus*
Silvio S. Varon, M.D., *Research Professor*
Sandra L. Vehrencamp, Ph.D., *Emeritus*
Jean Y. J. Wang, Ph.D., *Herbert Stern Endowed Chair*
Steven A. Wasserman, Ph.D.
Christopher J. Wills, Ph.D.
Flossie Wong-Staal, Ph.D., *Emeritus*
David S. Woodruff, Ph.D., *Chair, Ecology, Behavior, and Evolution Section*
Michael P. Yaffe, Ph.D.
Martin F. Yanofsky, Ph.D.
Charles S. Zuker, Ph.D.

Associate Professors

Raffi V. Aroian, Ph.D.
Willie C. Brown, Ph.D., *Emeritus, Academic Senate Career Distinguished Teaching Award*
Michael David, Ph.D.
P.A.G. Fortes, M.D., Ph.D.
Randolph Y. Hampton, Ph.D., *Academic Senate Distinguished Teaching Award, Chancellor's Associates Award for Excellence in Teaching*
John Huelsenbeck, Ph.D.
Randall S. Johnson, Ph.D.
Joshua R. Kohn, Ph.D.
Ramón Piñón, Ph.D., *Emeritus*
Kit J. Pogliano, Ph.D.
Kaustuv Roy, Ph.D.
Percy J. Russell, Ph.D., *Emeritus*
William R. Schafer, Ph.D.
Laurie G. Smith, Ph.D.

Assistant Professors

Lisa Boulanger, Ph.D.
Robert N. Dutnall, Ph.D.
Daniel E. Feldman, Ph.D.
Marla B. Feller, Ph.D.
Ananda Goldrath, Ph.D.
Tama Hasson, Ph.D.
Hopi Hoekstra, Ph.D.
David Holway, Ph.D.
Tracy Johnson, Ph.D.
Karen E. Marchetti, Ph.D.
James C. Nieh, Ph.D., *Walter Heiligenberg Endowed Chair*
Maho Niwa, Ph.D.
Amy Pasquinelli, Ph.D.
Joseph A. Pogliano, Ph.D.
Pamela Reinagel, Ph.D.

Robert C. Rickert, Ph.D.
Massimo Scanziani, Ph.D.
Yang Xu, Ph.D.
Yunde Zhao, Ph.D.

Senior Lecturer with Security of Employment

Gabriele K. Wienhausen, Ph.D., *Provost, Sixth College; Academic Senate Distinguished Teaching Award; Chancellor's Associates Faculty Award for Excellence in Teaching*

Lecturers with Security of Employment

Meredith Gould, Ph.D.
Muriel Nesbitt, Ph.D.

Lecturers with Potential for Security of Employment

Jon Christopher Armour, M.D., Ph.D.
Madeline Butler, Ph.D.

Adjunct Faculty

Sydney Brenner, Ph.D.
Steven Briggs, Ph.D.
Edward M. Callaway, Ph.D.
Seunghyon Choe, Ph.D.
Joanne Chory, Ph.D.
Joseph Ecker, Ph.D.
Scott Emr, Ph.D.
Ronald M. Evans, Ph.D.
Susan Forsburg, Ph.D.
Fred Gage, Ph.D.
Martyn D. Goulding, Ph.D.
Douglas R. Green, Ph.D.
Michael Gribskov, Ph.D.
Martin Haas, Ph.D.
Anthony R. Hunter, Ph.D.
Christopher Kintner, Ph.D.
Mitchell Kronenberg, Ph.D.
Nathaniel Landau, Ph.D.
Kuo-Fen Lee, Ph.D.
Marc R. Montminy, Ph.D.
Joseph Noel, Ph.D.
Dennis D.M. O'Leary, Ph.D.
Samuel Pfaff, Ph.D.
Animesh Ray, Ph.D.
Michael Geoffrey Rosenfeld, M.D.
Oliver A. Ryder, Ph.D.
Bartholomew M. Sefton, Ph.D.
John B. Thomas, Ph.D.
Wylie W. Vale, Ph.D.
Inder Verma, Ph.D.
Geoffrey M. Wahl, Ph.D.
Carl Ware, Ph.D.
Matthew Weitzman, Ph.D.
David J. Western, Ph.D.

Division of Biological Sciences Required Review of Student Progress

Freshmen

Effective fall 2002, the Division of Biological Sciences will eliminate pre-major status with the exception of the biology major with specialization in bioinformatics. Entering students who have indicated the desire to major in biology will be admitted directly to the biology major of their choice. To remain in good standing the student must complete a minimum of eight of the following courses (or equivalent) during their first five quarters at UCSD:

BILD 1, BILD 2, BILD 3

Chemistry 6A-B-C

Math 10A-20A, 10B-20B, 10C-11-20C

Physics 1A-2A, 1B-2B, 1C-2C

Chemistry 140A-141A, 140B-141B

BICD 100

BIBC 103

A student's best six grades from the eight courses listed will be used to calculate a GPA which must be at least a 2.5. If a student fails to complete the required courses, or to obtain the required minimum GPA, they will be dismissed from the biology major.

(**Note:** These are the minimal requirements to remain in the major, and do not satisfy all of the lower-division requirements of any biology major. Please consult the section regarding your particular major to ensure that you satisfy all lower-division and upper-division requirements.)

Continuing Students

Continuing UCSD students who wish to transfer into the major will be evaluated under the rules that were in effect the year in which they entered the university.

Transfer Students

Effective fall 2002, the Division of Biological Sciences will eliminate pre-major status with the exception of the biology major with specialization in bioinformatics. Entering students who have indicated the desire to major in biology will be admitted directly to the biology major of their choice. To remain in good standing the student must have completed eight of the following courses, or course equivalency, prior to transfer to UCSD:

BILD 1, BILD 2, BILD 3

Chemistry 6A-B-C

Math 10A-20A, 10B-20B, 10C-11-20C

Physics 1A-2A, 1B-2B, 1C-2C

Chemistry 140A-141A, 140B-141B

BICD 100

BIBC 103

A student's best six grades from the eight courses listed will be used to calculate a GPA which must be at least a 2.5. If a student fails to complete the required courses, or to obtain the required minimum GPA, they will be dismissed from the biology major. Transfer students who do not meet these requirements will be allowed a maximum of three quarters to satisfy any unmet requirements. Transfer students are therefore strongly encouraged to complete these requirements at their community college. (**Note:** These are the minimal requirements to remain in the major, and do not satisfy all of the lower-division requirements of any biology major. Please consult the section regarding your particular major to ensure that you satisfy all lower-division and upper-division requirements.)

Satisfactory Progress

All students admitted into a biology major must maintain satisfactory progress in order to remain in a biology program. If the GPA in biology courses for such a student falls below 2.0, he or she will be placed on probation during the quarter after the average fell below the line. If the GPA is not brought above the 2.0 level during the quarter on probation, the student will be dropped from the major.

Prerequisites

All students are expected to have completed all prerequisites prior to enrolling in any biology course. Please visit the student affairs office or consult our Web page for the most current information. Prerequisites are enforced in all courses and must be taken for a letter grade. Students who have satisfied the prerequisites of a class at another college may need to be pre-authorized to enroll. Please come to the biology student affairs office (1128 Pacific Hall) BEFORE your priority enrollment to be pre-authorized.

Exceptions

The division will accept petitions from students to remain in the major with less than the

required GPA or course work, and the success of such petitions will be evaluated based upon academic promise that is not reflected in the GPA. Exceptions might also be made to accommodate students who showed exceptional promise in laboratory experimentation, or students who had overcome extraordinary hardship while taking the required courses.

Enrollment in Biology Classes by Non-Biology Students

Because biology is a popular major, enrollment in some lower-division and upper-division biology courses is limited to biology majors, and those majors for which biology courses are required for graduation. Every effort will be made, on a space available basis, to enroll students from other majors in those biology lecture and laboratory courses which may be required for post-graduate study.

Division of Biological Sciences Residency Requirement

To receive a bachelor of science degree in biology from UCSD, all students must complete at least nine upper-division biology courses (each course must be at least four units) in the Division of Biological Sciences while officially enrolled at UCSD. (Students participating in the Education Abroad Program (EAP), and courses at other UC campuses, may petition up to three of these courses to count toward their residency minima.) Biology courses completed through the UC Extension program (concurrent enrollment) will not be counted toward this residency requirement.

Division of Biological Sciences Laboratory Requirement

Freshmen

Effective fall 2003, the Division of Biological Sciences will require students in all biology majors, with the exception of bioinformatics, to take one biology lab before the end of the sophomore year.

Continuing Students

Continuing UCSD students who wish to transfer into the major will be evaluated under the rules that were in effect the year in which they entered the university.

Transfer Students

Effective fall 2003, the Division of Biological Sciences will require students in all biology majors, with the exception of bioinformatics, to take one biology lab before the end of the sophomore year. Transfer students may petition to have community college course work cover the lab requirement. Transfer students whose community college laboratory course is determined to be equivalent in content to an existing biology lab will have completed the requirement upon transfer. Transfer students are therefore strongly encouraged to complete this requirement at their community college. Transfer students who do not meet this requirement at the time of transfer may petition the division for an extension.

Grade Requirements for the Majors

The minimum GPA requirement (for both the major and overall UC) for graduation is 2.0. D grades in courses required for the major are acceptable, providing that the student's major GPA and overall UC GPA is at least 2.0. Students who received D and/or F grades should contact one of the Division of Biological Sciences undergraduate advisers to determine the effect of such grades on their GPAs. The biology major GPA calculation is based on upper-division courses required for the major. (Upper-division courses from other UCs, other UCSD departments, and EAP which have been approved via petition to count toward the major are counted into the major GPA. Other transfer courses do not count toward the UC or major GPA.) All courses, required for any of the eight majors, must be taken for a letter grade with the exception of BISP 195, 196, 197, or 199.

Students with Transfer Credit

All courses (including prerequisites) taken at other institutions must be reviewed by the Division of Biological Sciences before they can be applied toward any major requirement. Students must obtain approval from the Biology Student Affairs office prior to taking courses outside of UCSD (for example, students wishing to take a Chem. 6BL equivalent at another institution must consult with Biology Student Affairs *before enrolling in the substitute course*). In addition, any student wishing to satisfy a major requirement with upper-division transfer work (with the exception of organic chemistry) must first submit a General Petition. Contact Biology Student Affairs (1128 Pacific Hall) for specific information regarding transfer documentation and petition procedures.

Effective fall 2000, the Division of Biological Sciences will require that students take the full content equivalencies to UCSD series in math, chemistry, and physics. The Division of Biological Sciences will follow the respective department's recommendations for equivalency. In some cases, attaining full content equivalency will require a student to complete more than two semesters in a subject. If the courses a student took do not provide full content equivalency, s/he will be required to complete the lacking material at UCSD or at a community college where the material is equivalent.

Programs Abroad

The Division of Biological Sciences strongly encourages students to participate in the Education Abroad Program (EAP) or the UCSD Opportunities Abroad Program (OAP). It is very important that students who plan to participate in the UC Education Abroad Program (including the Costa Rica Tropical Ecology program) or the UCSD Opportunities Abroad Program obtain the name of a faculty adviser from the Biology Student Affairs Office in order to discuss the proposed program of study. For most EAP programs, it is strongly recommended that biology majors complete biochemistry (BIBC 100 or 102) and genetics (BICD 100) and their prerequisites before going abroad.

Special Studies Courses

Only one quarter of BISP 195 and one quarter of BISP 196, 197, or 199 may be counted toward any biology major. For information on requirements and application procedures for special studies courses students should go to the Biology Student Affairs Office (1128 Pacific Hall).

BISP 195—Introduction to Teaching in Biology

Being a teaching assistant is an important task and can provide students with experience and faculty contact which can be valuable when applying for graduate school. Students who are interested in being an undergraduate tutor should have received a strong grade in the course which they want to teach, have an overall GPA of at least 3.0, and have taken at least ninety total

units. Students should apply very early in the quarter prior to the quarter they wish to teach. Applications will be accepted beginning the second week of the quarter prior to the quarter in which the student wishes to teach. All undergraduate tutor applications are online and may be accessed through the biology Web site, http://www.biology.ucsd.edu/undergrad/index.html.

BISP 196—Honors Thesis in Biological Sciences

Students in any one of the eight biology major programs who have a 3.7 grade-point average or above in upper-division science courses, the biology major, and overall UC at the end of their junior year are eligible to undertake the honors thesis. This program covers the senior year of undergraduate study and involves a maximum of twelve units of senior thesis research (BISP 196) taken in addition to the major requirements for graduation. (Four units of senior thesis research BISP 196 are to be taken during three consecutive quarters.) Research is conducted under the supervision of a faculty member of the Division of Biological Sciences only and cannot be performed in the research labs of other departments such as the School of Medicine, SIO, etc. If there are any questions as to which faculty members are eligible, students should consult with Biology Student Affairs. The research will culminate in a senior thesis and an oral report (see below). Students who complete the program satisfactorily will have "Distinction in Biology" recorded on their transcript. Students who fail to make satisfactory progress will be advised to withdraw from the program and, if eligible, will receive four units per quarter of BISP 199. Students may also withdraw voluntarily from the program and, if eligible, receive appropriate credit for BISP 199. Grades for BISP 196 are P, NP, or I only.

APPLICATION TO THE HONORS THESIS PROGRAM

1. Students interested in the program who are eligible as of the end of the spring quarter of their junior year (the fourth quarter prior to graduation) need to find a Division of Biological Sciences faculty member willing to act in the capacity of thesis adviser and inform the Biology Student Affairs Office of their intent.
2. After an adviser is selected, the student and the adviser should complete the Special Studies application form (available from the Biology Student Affairs Office, 1128 Pacific Hall). The form should contain the research proposal.
3. The application form should then be submitted to the Biology Student Affairs Office. The deadline for submitting this form is the end of the eighth week of the quarter prior to the quarter the research will begin.
4. The application will be submitted to the honors thesis coordinator after eligibility has been determined.
5. If the student is approved for admission to the program, he or she will then be authorized to register for BISP 196.

Entry into the second and third quarter of the program will require submission to the honors thesis adviser of a written report in which the student summarizes the data obtained in the previous quarters. A brief oral interview with the student on this report can also be expected. If the progress made appears reasonable for an honors student, then the 196 petition will be signed. If not, conversion of the 196 credit to BISP 199 will be recommended. Completion of the program will require a final written report by the student at the end of the third quarter in addition to an oral presentation in the middle of the quarter to a suitable group of faculty and students, including the honors thesis adviser.

BISP 197—Biology Internship Program

The Division of Biological Sciences, in collaboration with local biotech industries, created Biotechnology Internship Opportunities (BIO). The mission of BIO is to provide biology majors with an opportunity to participate in research in an industrial setting. We believe that working as an intern in the private sector will enrich a student's educational experience. Students will gain valuable insight into the relationship between theory and practice, and hence, a better understanding of the relevance of course work in their major. Most importantly, students will learn the importance of outstanding oral and written communication skills. This course may be counted as one of the upper-division electives for a biology major, providing that no other special studies courses have already been counted toward the major. Information on BIO may be accessed through the undergraduate biology Web site, http://www.biology.ucsd.edu/undergrad/index.html.

To enroll in BISP 197, students must have accrued at least ninety-quarter units with an overall UC GPA of at least 3.0.

There will be one weekly scheduled meeting lasting up to 1.5 hours. Attendance and participation at these meetings are mandatory and will affect the grade a student receives. There will be three formal oral and three written presentations, interspersed with informal discussions of progress achieved. All written reports must be done with the input of the industry and must have that mentor's signature. Grading will be based on the formal and informal written and oral presentations, as well as input from the industry mentor.

BISP 199—Independent Study for Undergraduates

Independent Study BISP 199 is intended to provide interested and qualified biology students with an opportunity to work closely with faculty and professionals in their chosen field and can be a valuable contribution to the student's preparation for graduate school or career goals. To enroll in BISP 199, students must have accrued at least ninety quarter-units with an overall UC GPA of at least 3.0. Students may select for their instructor any professor at UCSD, but the BISP 199 application must be submitted for approval to the Division of Biological Sciences. The deadline to apply for BISP 199 is the eighth week of the quarter prior to the quarter in which the research will begin.

AIP 197—Academic Internship Program

Because the undergraduate research conducted through the Academic Internship Program is generally done at a site not affiliated with the UCSD Division of Biological Sciences, students who wish to request that an AIP 197 course be counted toward their major must submit a General Petition for their request before the end of the eighth week of the quarter prior to the quarter in which research will begin. This early deadline allows time for the biology faculty to review and contribute to the student's research proposal and ascertain the project's compatibility with the student's academic goals. If an AIP 197 course is approved for the student's major, no other special studies course (BISP 196, 197, or 199) can be used toward the major. For further information, please see http://aip.ucsd.edu.

Major Programs in Biological Sciences

For more information, please see biology's web page, http://www-biology.ucsd.edu/

The UCSD Division of Biological Sciences is structured around the different levels of biological organization—biochemical, cellular, physiological, and ecological. The research and teaching of the division emphasize the fundamentally important processes that occur at each of these levels. With a solid foundation in these processes future training and study in any area of biology is possible, from plant breeding to genetic counseling, from medical microbiology to ecological epidemiology, from veterinary science to cancer research. The UCSD campus is situated among some of the finest research institutions in the world. The Division of Biological Sciences is fortunate in having close ties with the Scripps Institution of Oceanography, the Salk Institute of Biological Studies, and the Scripps Clinic and Research Foundation, all of which open interesting avenues for motivated students.

The division offers eight different major programs, each of which provides an excellent background for future graduate or professional study. They are (1) animal physiology and neuroscience, (2) biochemistry and cell biology, (3) biology with a specialization in bioinformatics, (4) ecology, behavior, and evolution, (5) general biology, (6) human biology, (7) microbiology, and (8) molecular biology. The requirements of each of the majors are designed to meet the needs of a different group of students. These requirements are quite concordant, reflecting the division's philosophy that familiarity with certain basic aspects of the subject is fundamental to all specialized understanding. Bachelor of science degrees granted in each of these majors will be so designated.

The Student Affairs Office (1128 Pacific Hall) administers the undergraduate biology program for all six colleges. For complete details regarding policies and procedures pertaining to the biology programs, please contact Biology Student Affairs.

Animal Physiology and Neuroscience Major

Please refer to the "Division of Biological Sciences Required Review of Student Progress" notice detailed earlier in the Division of Biological Sciences section of this catalog.

The animal physiology and neuroscience major provides a program for studying the bodily and neural functions of complex organisms. Within this major, a student may concentrate upon more specialized areas of study, such as human biology, neurobiology, or endocrinology. This major is most directly applicable to health-related professions such as medicine, nursing, dentistry, veterinary medicine, pharmacy, physical therapy, and medical technology. Animal physiology and neuroscience majors are also well prepared to enter other professions such as physiological research, physical education, agriculture, and wildlife management.

Lower-Division Requirements

BILD 1 and 2 or BILD 1 and 3

Chemistry 6A-B-C, and one lab

Mathematics 10A-B, and 10C or 11 or 20A-B-C

Physics 1A/1AL, 1B/1BL, 1C/1CL or 2A-B-C, and one lab

Upper-Division Requirements

Listed below are the upper-division courses required for the animal physiology and neuroscience major. The first four requirements provide exposure to the current understanding of subcellular function that should be at the command of all modern biologists. Requirements 6 and 7 constitute the core of the animal physiology and neuroscience major. By choosing three optional four-unit upper-division biology courses (requirement 9), a program geared to the needs of the individual student can be formulated.

1. Organic Chemistry (Chemistry 140A, 140B, or 141A, 141B)
2. Organic Chemistry Laboratory (Chemistry 143A)
3. Metabolic Biochemistry (BIBC 102)
4. Genetics (BICD 100)
5. Molecular Biology (BIMM 100)
6. Four from the following seven courses:

   Mammalian Physiology I (BIPN 100)
   Mammalian Physiology II (BIPN 102)
   Comparative Physiology (BIPN 106)
   Cellular Neurobiology (BIPN 140)
   Systems Neurobiology (BIPN 142)
   Developmental Neurobiology (BIPN 144)
   Computational Neurobiology (BIPN 146)
7. One of four laboratories (BICD 131, BICD 133, BIPN 105, BIPN 145)
8. One upper-division biology lab to be chosen from the following: BIBC 103, 105, BICD 101, 111, 123, 131, 133, 145, BIEB 121, 131, 165, 167, 179, BIMM 101, 103, 121, 127, BIPN 105, 145. This requirement may include a lab from number 7 that has not already been taken by the student.
9. Three additional upper-division biology courses (each course must be at least four units) taken through the UCSD Division of Biological Sciences are required and may include the above (numbers 6–8). These may include no more than one quarter of BISP 195 and one quarter of either BISP 196, 197, or 199 (AIP 197 may be used in place of BISP 196, 197, or 199 upon approval by the faculty adviser). (Subsequent quarters of 195, 196, 197, or 199 may be applied toward college and university requirements.)

Biochemistry and Cell Biology Major

Please refer to the "Division of Biological Sciences Required Review of Student Progress" notice detailed earlier in the Division of Biological Sciences section of this catalog.

This major is designed to provide students with the fundamental courses required for entry into a school of medicine or into postgraduate training in a wide variety of areas of biological and biomedical sciences: biochemistry, biophysics, genetics, molecular biology, cell biology, developmental biology, microbiology, virology, human biology (physiology, metabolism, genetic disorders), cancer biology, pharmacology, and others. The emphasis is on basic principles which help us understand those processes unique to living organisms at the molecular level.

The program includes two required upper-division biology laboratory courses to provide practical experience with modern techniques and useful technology for those seeking positions as lab technicians in clinical and basic research laboratories. The opportunity to select five elective courses allows students either to seek a still broader background in a variety of biology courses or to begin specialization in a chosen field of study.

Lower-Division Requirements

BILD 1 and 2 or BILD 1 and 3

Chemistry 6A-B-C, and one lab

Mathematics 10A-B, and 10C or 11 or 20A-B-C

Physics 1A/1AL, 1B/1BL, 1C/1CL or 2A-B-C, and one lab

Upper-Division Requirements

1. Organic Chemistry (Chemistry 140A and 140B or 141A and 141B)
2. One chemistry laboratory: Organic Chemistry (Chemistry 143A) or Physical Chemistry (Chemistry 105A)
3. Structural Biochemistry (BIBC 100) or Physical Biochemistry (BIBC 110) or Physical Chemistry (Chemistry 126)
4. Metabolic Biochemistry (BIBC 102)
5. Biochemical Techniques (BIBC 103)
6. Genetics (BICD 100)
7. Cell Biology (BICD 110)
8. Molecular Biology (BIMM 100)
9. One of the following four courses: Signal Transduction Lab (BIBC 105), Physical Biochemistry (BIBC 110), Pathways of Intracellular Protein Trafficking and Compartmentation (BICD 118), Pharmacology (BIMM 118)
10. One upper-division biology lab to be chosen from the following: BIBC 105, BICD 101, BICD 111, BICD 123, BICD 131, BICD 133, BICD 145, BIMM 101, BIMM 103, BIMM 121, BIMM 127, BIMM 141, BIPN 105, BIPN 145), or Organic Chemistry (Chemistry 143C).
11. Four additional upper-division biology courses (each course must be at least four units) taken through the UCSD Division of Biological Sciences are required. Only one quarter of BISP 195 and one of BISP 196, 197, or 199 may be applied toward the fulfillment of this requirement. Students may use only one BISP 199 for meeting major requirements. (Subsequent quarters of BISP 195, 196, 197, or 199 may be applied toward college and university requirements.)

The following courses offered by the Department of Chemistry and Biochemistry are recommended as electives for the biochemistry and cell biology major: Chemistry 115, 116, 122, 124, 126, 127. Please note that these courses will not count towards the Division of Biological Sciences residency requirement and must be petitioned.

Bioinformatics Specialization in the Division of Biological Sciences

This major offers a rigorous, interdisciplinary training in the new and rapidly-evolving field of bioinformatics within the Division of Biological Sciences. Bioinformatics refers to advanced computational and experimental methods that model the flow of information (genetic, metabolic, and regulatory) in living systems to provide an integrated understanding of the systems properties of model organisms. For a detailed understanding of the large amount of qualitative and quantitative data that is currently accruing, the bioinformatician of the future must have a substantial mastery in biology, chemistry, mathematics, physics, and computer sciences. This interdisciplinary specialization will be offered by three other departments (computer science and engineering, chemistry, and bioengineering), each with their own set of requirements and electives. The program offered by the Division of Biological Sciences is aimed at a student interested in applying, and to some extent developing, tools of bioinformatics for the study of biological systems. Students will receive a B.S. degree in Biology with a Specialization in Bioinformatics. This degree will prepare students for graduate studies in biological and biomedical sciences, or provide excellent opportunities in the biomedical, pharmaceutical, biotechnology, and bioinformatics industries.

Admission

Because the number of pre-majors and majors will be limited as described in the section on bioinformatics, student demand may exceed capacity. Therefore, admission to the specialization is not guaranteed and will be based on academic excellence, as described below. Since bioinformatics is an interdisciplinary major, a steering committee involving faculty from the participating departments will select among the best candidates applying and recommended through each department, while insuring active participation of the departments and divisions offering the major.

Freshmen

Effective fall 2001, entering freshmen will go through a two-stage process to be admitted to a bioinformatics program. Students should enter the division as a declared major in some subdiscipline offered by the division (e.g., molecular biology, general biology, etc.) Freshmen can choose to apply for a bioinformatics pre-major after completing the following courses by the end of their first year. Admission will be based primarily on the GPA in the following courses, but also on a written statement, completion of the other listed requirements and overall academic excellence:

BILD 1

Chemistry 6A

Math 20B

Math 20C

Pre-bioinformatics majors can then choose to apply for admission to the bioinformatics major after competing CSE 11 and CSE 12 by the end of their sophomore year. Admission to the bioinformatics major within each department or division will be based on the GPA in all six screening courses. The final decision on admission to the pre-major and major will be made by the bioinformatics Steering Committee, in consultation with the departments.

If a student applies for admission to the bioinformatics specialization but is not selected after completion of the screening courses, that student will be eligible to remain in the specialization or major to which they were admitted initially. Students with undeclared majors may also apply to the bioinformatics specialization, but in the event they are not selected for this competitive major, they may choose any other major in biology as long as they satisfy the requirements of that major.

Continuing Students

Students who have not declared the bioinformatics pre-major, but who have completed the screening courses, may apply for entry to a bioinformatics program after six quarters (the end of the sophomore year). They will be admitted on a space-available basis, after pre-majors have been screened for admission to the major.

Transfer Students

Effective fall 2003, applicants seeking admission to a bioinformatics major must have

completed the following courses with a strong GPA that is competitive with that of UCSD students applying for entry into this specialization:

a year of calculus (equivalent to Math 20A-B-C)

a year of general chemistry, with lab (equivalent to Chem 6A-B-C and 6BL)

the highest level programming course offered at the community college (equivalent to CSE 11 and 12)

one semester of biology (equivalent to BILD 1 and BILD 2)

Those who have not completed the equivalent courses may be admitted as pre-majors, using the same criteria that apply for UCSD students, and will be allowed a maximum of three quarters to complete pre-major requirements. Transfer students are therefore encouraged to complete these requirements at the community college.

If a student applies for admission to a bioinformatics specialization but is not selected after completion of the screening courses, that student will remain eligible for specialization or major to which they were originally admitted.

Lower-Division Requirements

Mathematics 20A-B-C, 20F and Mathematics 15B or CSE 21

Chemistry 6A-B-C, and lab

Physics 2A-B-C

BILD 1 and 2

BILD 94

CSE 11, CSE 12 (Students may take the slower paced version, CSE 8A + CSE 8B, instead of CSE 11.)

Upper-Division Requirements

1. Organic Chemistry (Chemistry 140A-B)
2. Advanced Data Structure (CSE 100 or Mathematics 176)
3. Design and Analysis of Algorithms (CSE 101 or Mathematics 188)
4. Metabolic Biochemistry (BIBC 102) or Biochemical Energetics and Metabolism (Chemistry 114B)
5. Biochemical Techniques (BIBC 103)
6. Physical Biochemistry (BIBC 110) or Physical Chemistry (Chemistry 127)
7. Genetics (BICD 100)
8. Cell Biology (BICD 110)
9. Molecular Biology (BIMM 100) or Molecular and Cellular Biochemistry (Chem 114D)
10. Recombinant DNA Lab (BIMM 101)
11. Molecular Sequence Analysis (BIMM 181)
12. Biological Databases (BIMM 182)
13. Applied Genomic Technologies (BENG 183)
14. Computational Molecular Biology (BIMM 184)
15. Bioinformatics Lab (BIMM 185)
16. Probability and Statistics (Math 186)
17. Three additional upper-division biology courses (each course must be at least four units) taken through the UCSD Division of Biological Sciences are required.

Ecology, Behavior and Evolution Major

Please refer to the "Division of Biological Sciences Required Review of Student Progress" notice detailed earlier in the Division of Biological Sciences section of this catalog.

This major includes the fields of population biology, ecology, conservation biology, animal behavior, population genetics, biogeography, and evolution. These fields have in common a focus on evolutionary processes and whole organisms in relation to each other and to their environments. Research careers in ecology, behavior, and evolution can be found in universities, government agencies, and the biotechnology industry. More applied careers for ecologists are equally varied: recent graduates now work in forestry and wildlife management, as ecological consultants for U.S. and foreign governments and private industry, as teachers, or in new fields such as ecological medicine and epidemiology, environmental design and planning, and conservation biology. Because organismal biology spans such a wide variety of topics, this major has been designed to provide the basic fundamentals while allowing maximum flexibility within the general topic areas.

Lower-Division Requirements

BILD 1, 2, and 3

Chemistry 6A-B-C. Laboratories in chemistry are not required.

Mathematics 10A-B, and 10C or 11 or 20A-B-C

Physics 1A/1AL, 1B/1BL, 1C/1CL or 2A-B-C

Upper-Division Requirements

1. Genetics (BICD 100)
2. Biometry (BIEB 100)
   This course is a prerequisite for several core courses and should be taken in the first or second year.
3. Ecology (BIEB 102)
4. Evolution (BIEB 150)
5. Seven core courses to be chosen from BIEB 121-180 are required. At least two of these courses must be laboratory or field courses (BIEB 121, 131, 165, 167, and/or 179). Laboratory courses may be taken either concurrently with the prerequisite lecture course *if Biometry (BIEB 100) has been taken.* Note that some of the courses may not be offered every year. For that reason, it is recommended that students take as many required courses as possible when the courses are offered. Students who take the intensive EAP field courses in tropical biology offered in Costa Rica or marine biology in Australia will receive credit toward their degree. All EAP courses must be petitioned upon return. Consult the Education Abroad Program Office at the UCSD International Center for details.
6. Three additional upper-division courses (each course must be at least four units) in biology or other departments are required. EBE-related courses are offered in mathematics, chemistry, environmental systems, earth sciences, economics, biological anthropology, urban studies (GIS), some other social science departments, and in the graduate programs at SIO (marine biology and oceanography) and IR/PS. *Students are required to meet the Division of Biological Sciences residency requirement.* Courses to be completed outside of the Division of Biological Sciences **must be petitioned** (prior to enrollment) to satisfy this requirement. Only one quarter of BISP 196, 197, or 199 and one quarter of BISP 195 may be used to fulfill this requirement. (Subsequent quarters of 195, 196, 197, or 199 may be applied toward college and university requirements.) EBE students whose graduate education or careers require biochemistry should take Organic Chemistry 140A, 140B, and Metabolic Biochemistry (BIBC 102) to satisfy this three-course requirement.

A systemwide supercourse in environment biology held at the White Mountain Research

station provides another attractive alternative to gaining field experience. For more information, consult http://www.wmrs.edu/

General Biology Major

Please refer to the "Division of Biological Sciences Required Review of Student Progress" notice detailed earlier in the Division of Biological Sciences section of this catalog.

This program allows the most diversified exposure to biology of any of the majors offered by the Division of Biological Sciences. It is designed for students with broad interests who do not wish to be constrained by the specialized requirements of the other majors and who desire maximum freedom to pursue their particular educational goals.

Lower-Division Requirements

Lower-division requirements are designed to provide the foundations in mathematics, physics, and chemistry that are fundamental to the study of biology. In addition, an introduction to biology is required to provide the appropriate background for upper-division biology courses. The lower-division requirements are subsumed in large part under those of the various colleges.

BILD 1, 2, and 3
Chemistry 6A-B-C, and one lab
Mathematics 10A-B, and 10C or 11 or 20A-B-C
Physics 1A/1AL, 1B/1BL, 1C/1CL or 2A-B-C and one lab

Upper-Division Requirements

Listed below are the upper-division course requirements for the general biology major. Specific requirements have been held to a minimum for this major in order to allow students maximum freedom in fitting course schedules to their particular educational goals. Because of the central positions of biochemistry and genetics in all of modern biological thought, only Biochemistry (BIBC 100 or 102), its organic chemistry prerequisites (Chemistry 140A and B), and Genetics (BICD 100) are prescribed requirements for general biology majors.

1. Organic Chemistry (Chemistry 140A and 140B or 141A and 141B)
2. Metabolic Biochemistry (BIBC 102)
3. Genetics (BICD 100)
4. Two upper-division biology labs to be chosen from the following: BIBC 103, 105, BICD 101, 111, 123, 131, 133, 145, BIEB 121, 165, 167, 179, BIMM 101, 103, 121, 127, BIPN 105, or 145.
5. Seven additional upper-division biology courses (each course must be at least four units) taken through the UCSD Division of Biological Sciences are required. Only one quarter of BISP 195 and one quarter of either BISP 196, 197, or 199 may be applied toward this requirement. (Subsequent quarters of 195, 196, 197, or 199 may be applied toward college and university requirements.)

Although students are free to design upper-division curricula which meet their individual educational goals, Molecular Biology (BIMM 100) and Cell Biology (BICD 110) are strongly recommended for those contemplating applying to graduate or professional schools.

Human Biology Major

This major is designed to provide students with the fundamental courses required for entry into: schools of medicine, veterinary medicine, dentistry, and pharmacy; Ph.D. programs in the biomedical sciences; and biotech research, teaching, medical technology, patent law, physical therapy, nutrition, and nursing. The core classes required of all human biology majors provide the student with the basic principles that help us understand normal human physiology and the molecular basis of human disease. The course options in Human Physiology, Human Disease, and Biomedical-related laboratories provide the students with educational breadth while still allowing them considerable flexibility in tailoring their course of study to suit their educational goals.

Lower-Division Requirements

1. BILD 1 and BILD 2 or BILD 1 and BILD 3
2. Chemistry 6A, 6B, 6C and one lab
3. Physics 1A/1AL, 1B/1BL, 1C/1CL or Physics 2A, 2B, 2C and Physics Lab (2BL or 2CL)
4. Mathematics 10A-B, and 10C or 11 or 20A-B-C

Upper-Division Requirements

1. Organic Chemistry (Chemistry 140A and 140B or 141A and 141B)
2. Organic Chemistry Lab (Chemistry 143A)
3. Metabolic Biochemistry (BIBC 102)
4. Genetics (BICD 100)
5. Molecular Biology (BIMM 100)
6. Molecular Basis of Human Disease (BIMM 110)
7. Mammalian Physiology I (BIPN 100)
8. Three courses from the following two groups, Human Physiology and Human Disease. At least one course must be taken from each group.

Human Physiology
Nutrition (BIBC 120)
Embryos, Genes, and Development (BICD 130)
Human Reproduction and Development (BICD 134)
Immunology (BICD 140)
Endocrinology (BICD 150)
Mammalian Physiology II (BIPN 102)
Biology of Exercise (BIPN 108)
Cellular Basis of Learning and Memory (BIPN 148)

Human Disease
AIDS Science and Society (BICD 136)
Topics in Human Genetics (BICD 170)
Virology (BIMM 114)
Pharmacology (BIMM 118)
Bacteriology (BIMM 120)
Medical Microbiology (BIMM 124)
Biology of Cancer (BIMM 134)

9. Two of the following lab courses:
Biochemical Techniques (BIBC 103)
Signal Transduction Lab (BIBC 105)
Cell Biology Lab (BICD 111)
Embryology Lab (BICD 131)
Developmental Biology Lab (BICD 133)
Laboratory in Molecular Medicine (BICD 145)
Recombinant DNA Techniques (BIMM 101)
Microbiology Lab (BIMM 121)
Animal Physiology Lab (BIPN 105)
BISP 196/199 (The second consecutive quarter of BISP 196 or 199 taken in the same research laboratory may be substituted for one of the upper-division lab requirements.)
10. At least two other upper-division courses (each course must be at least four units) offered by the UCSD Division of Biological Sciences. Recommended courses include additional courses from the Human Physiology and Human Disease lists in section 8 above and BICD 110 (Cell Biology), BIEB 154 (Molecular Evolution), and BICD 118 (Pathways of Intracellular Protein Trafficking and Compartmentation). Other acceptable courses include one

quarter of BISP 195 and one quarter of either BISP 196, 197, or 199. (Exception: students who use BISP 196 or 199 to satisfy the lab requirement in section 9 above cannot use BISP 196, 197, or 199 to satisfy this requirement.)

Microbiology Major

Please refer to the "Division of Biological Sciences Required Review of Student Progress" notice detailed earlier in the Division of Biological Sciences section of this catalog.

The microbiology major is designed to prepare students for graduate studies and for professional careers in a variety of health-related programs. The specialization in microbiology can provide the basic background for work in medical technology, or for further training in public health or other health-related specialties. The program is also designed to provide a foundation for graduate studies in microbiology, virology, and a variety of allied fields as well as for medical and dental school.

Lower-Division Requirements

BILD 1 and 2 or BILD 1 and 3

Chemistry 6A-B-C, and one lab

Mathematics 10A-B, and 10C or 11 or 20A-B-C

Physics 1A/1AL, 1B/1BL, 1C/1CL or 2A-B-C and one lab

Upper-Division Requirements

1. Organic Chemistry (Chemistry 140A-B or 141A-B)
2. Organic Chemistry Laboratory (Chemistry 143A)
3. Metabolic Biochemistry (BIBC 102)
4. Biochemical Techniques (BIBC 103)
5. Genetics (BICD 100)
6. Immunology (BICD 140)
7. Molecular Biology (BIMM 100)
8. Virology (BIMM 114)
9. Bacteriology (BIMM 120)
10. Laboratory in Microbiology (BIMM 121)
11. Medical Microbiology (BIMM 124)
12. Three additional upper-division biology courses (each course must be at least four units) taken through the UCSD Division of Biological Sciences are required. These may include no more than one quarter of BISP 195 and one quarter of BISP 196, 197, or 199. (Subsequent quarters of 195, 196, 197, or 199 may be applied toward college and university requirements.) Other courses of special interest to microbiology majors are listed below:

    Cell Biology (BICD 110)

    Regulation of Gene Activity in Eucaryotic Cells (BIMM 112)

    Microbial Genetics (BIMM 122)

    Recombinant DNA Techniques (BIMM 101)

Molecular Biology Major

Please refer to the "Division of Biological Sciences Required Review of Student Progress" notice detailed earlier in the Division of Biological Sciences section of this catalog.

The program for molecular biology is designed to provide an intensive exposure to the theoretical concepts and experimental techniques of molecular biology. The concepts and techniques of molecular biology are the foundation for the studies of all aspects of biology in modern time. A focus on molecular biology, therefore, provides an excellent preparation for a wide range of advanced studies including basic research, medicine, bioengineering, and biotechnology. Considerable emphasis is placed on chemistry, biochemistry, and genetics for students enrolled in the program. As such, it is recommended for those students who have a particularly strong interest in this field of study.

Lower-Division Requirements

BILD 1 and 2 or BILD 1 and 3

Chemistry 6A-B-C, and one lab

Mathematics 20A-B-C

Physics 1A/1AL, 1B/1BL, 1C/1CL or 2A-B-C, and one lab

Upper-Division Requirements

1. Organic Chemistry (Chemistry 140A-B or 141A-B)
2. Organic Chemistry Laboratory (Chemistry 143A) or Physical Chemistry Laboratory (Chemistry 105A)
3. Structural Biochemistry (BIBC 100)
4. Metabolic Biochemistry (BIBC 102)
5. Biochemical Techniques (BIBC 103)
6. Genetics (BICD 100)
7. Cell Biology (BICD 110)
8. Molecular Biology (BIMM 100)
9. Recombinant DNA Techniques (BIMM 101)
10. Regulation of Gene Activity in Eukaryotic Cells (BIMM 112)
11. Microbial Genetics (BIMM 122)
12. Four additional upper-division biology courses (each course must be at least four units) taken through the UCSD Division of Biological Sciences are required. Attention is drawn to BICD 120, BICD 122, BICD 140, BIMM 110, and BIMM 114. Only one quarter of 196, 197, or 199 and one of BISP 195 may be used to fulfill this requirement. (Subsequent quarters of BISP 195, 196, 197, or 199 may be applied toward college and university requirements.)

Minor in Biological Sciences

To receive a minor from the Division of Biological Sciences, a student must complete at least seven four-unit biology courses, including at least five four-unit upper-division biology courses (for a total of at least twenty-eight units of course work). Students may apply transferable biology courses from another institution toward the lower-division requirement, after obtaining approval from both the UCSD Division of Biological Sciences *and* the student's college. Upper-division courses must be taken for letter grade. No courses taken outside of the Division of Biological Sciences may be applied toward the biology minor (i.e., Chemistry 140A, Psychology 106, etc.). Advanced placement biology scores of four or five may be counted in lieu of BILD 1 and BILD 2. An advanced placement biology score of three may be counted in lieu of BILD 10.

Secondary School Biology Teaching

UCSD's biological sciences division is committed to the education of future biology teachers and offers an excellent preparation for teaching biology in secondary schools. If you are interested in earning a California teaching credential from UCSD, contact the Teacher Education Program for information about the prerequisite and professional preparation requirements. It

is recommended that you contact TEP and the Biology Student Affairs Office early in your academic career to help you plan a suitable biology curriculum. If you plan to get your credential at another institution, keep in mind that a broad education in biology is the best preparation to become a teacher.

We suggest that students take courses in plant and animal biology, microbiology, ecology, population biology, evolution, marine biology, genetics, and biochemistry. Courses in cellular and molecular biology are also advisable. After completion of BILD 1, 2, and 3, a suggested program of upper-division courses would be: BIBC 100 or 102, BICD 100, 120, 130, BIEB 102, 150, BIPN 106, SIO 275B. This would give you as a prospective teacher the required breadth of education.

Integrated Bachelor's/ Master's Degree Program

An integrated program leading to a bachelor of science degree and a master of science degree in biology is offered to those undergraduate students who are enrolled in any of the major programs offered by the Division of Biological Sciences at UCSD. Qualified students are able to obtain the M.S. degree within one year following receipt of the B.S. degree. Students interested in applying to this program should meet with the BS/MS adviser in the Biology Student Affairs Office BEFORE the end of their junior year.

The program is open only to UCSD undergraduates. The Division of Biological Sciences does not have financial aid available for students enrolled in this program.

Eligibility and Enrollment

To be eligible, students must have completed the first two quarters of their junior year in residence at UCSD and must have an overall UC GPA of at least 3.0. Students' major GPA should be at least 3.3. Students must demonstrate excellent performance in upper-division biology core courses during their undergraduate program to be eligible to enroll in biology graduate core courses.

It is the responsibility of the prospective B.S./M.S. student to select a faculty member (from the Division of Biological Sciences) who would be willing to serve as the student's adviser and in whose laboratory the student would complete at least twenty-four units of research over a two-year period. The units of research which must be completed during the student's senior undergraduate year, must be taken IN ADDITION to the requirements for the bachelor's degree. These units will count toward the requirements for the master's degree only. Students must complete six consecutive quarters of research to fulfill the research component of the program. Any deviation from this plan, such as a break in enrollment for one or more quarters, will be cause for the student to be dropped from the program.

Students who have been approved (by both the Division of Biological Sciences and the UCSD Office of Graduate Admissions) for the program must enroll in a Special Studies Course, BGGN 271, for each, and every, quarter of participation in the B.S/M.S. program. Students can obtain the appropriate course code and division stamp at the Biology Student Affairs Office.

Research work (BGGN 271) will be credited toward the B.S./M.S. program requirements only if it is completed during the time a student is officially enrolled at UCSD and has paid tuition for that quarter.

Requirements for the Master of Science Degree

1. Completion of six consecutive quarters of research during the senior undergraduate year and the graduate year.
2. Completion of at least thirty-six units of graduate course work (BGGN 200-level or higher, or approved [via petition] graduate courses offered by related departments at a similar level) during the graduate year. The course of study must be approved by the faculty adviser.
3. Twelve of the thirty-six units must be in courses other than BGGN 271 (BGGN 297 and BGGN 299 may not be used to satisfy this requirement).
4. Serve as a graduate teaching assistant.
5. Maintenance of a grade-point average (both overall and in the major) of at least 3.0 for all course work, both cumulatively and for each quarter of enrollment in the B.S./M.S. program. If the student's GPA falls below 3.0 (for either overall or in the major), he or she will be automatically dropped from the program.
6. Completion of a thesis, with an oral presentation to, and approval of, a three-member Thesis Committee. A student may have any regular faculty at UCSD or any adjunct faculty as their adviser and chair of their Thesis Committee. The Thesis Committee must contain at least two regular faculty from the Division of Biological Sciences and no more than one adjunct faculty can serve on the committee. If an adjunct faculty serves as chair of the Thesis Committee, one of the biology members must serve as co-chair.
7. At least three complete, separate, and consecutive quarters of residency as a graduate student which will commence the quarter immediately following the quarter in which the B.S. degree is awarded. (Note: The summer session is not considered an official quarter during the graduate year.)
8. Students who have been approved for the B.S./M.S. program must provide the Office of Graduate Admissions with a copy of their official UCSD transcripts with the B.S. degree posted, PRIOR TO THE COMMENCEMENT OF THE GRADUATE YEAR IN THE PROGRAM.

Non-Degree Program

The Division of Biological Sciences will accept applicants into the non-degree program for a maximum of one year only. Qualified applicants must have at least a 3.0 GPA in their upper-division work to be accepted. Justification will not be made for those who fall below the GPA minmum.

Students who wish to apply to the UCSD biological sciences Ph.D. program at a later date should not apply for this program. However, students who have applied to graduate or medical schools elsewhere, but have not yet been accepted, are welcome to apply.

Once accepted into this program, the student has graduate status for the academic year. Courses may be taken on the undergraduate or graduate level with consent of the instructor. Students will not be assigned faculty advisers and must make their own academic plans.

The Doctoral Program

Graduate studies for a Ph.D. degree in the Division of Biological Sciences in affiliation with the Salk Institute are oriented mainly toward the development of the capacity for independent research and for teaching in the biological sciences.

The requirements for entrance to graduate study in the Division of Biological Sciences are flexible, but a strong background in mathematics, chemistry, and physics is recommended.

Formal course work and opportunities for dissertation research include most basic areas of experimental biology, with emphasis in the general areas of biochemistry, biophysics, cell biology, developmental biology, genetics, immunology, molecular biology, neurobiology, plant molecular biology, ecology, behavior and evolution, virology, and cancer biology.

During the first year of graduate study, each student undertakes a research project in the laboratory of each of four to six different faculty members, and is expected to spend a major portion of his or her academic time on this project. The laboratories are selected by the student in consultation with the first year adviser to provide a broad view of the research interests of the division. The student is also expected to enroll in the first-year graduate biology sequence which includes advanced material in genetics, developmental biology, plant biology, neurobiology, molecular biology, cell biology, virology, and immunology. Students are also required to complete a minimum of twelve units of BGGN 500 (Apprentice Teaching in Biology.) A program of further study, including seminars and courses appropriate to a student's background and interests, is arranged through consultation between the student and the faculty. Much reliance is placed on informal instruction through early and close association of the student with the faculty and research staff, and through regular seminars. After becoming familiar with the research activities of the faculty through the laboratory rotation program, the student begins work on a thesis research problem of his or her choice no later than the end of the first year. The student is free to choose for the thesis adviser a regular member of the UCSD faculty or an adjunct member of the Division of Biological Sciences faculty. The student is required to have completed a two-part examination in order to be admitted to candidacy for the Ph.D. degree. The purpose of the examinations is for the student to demonstrate competence in the field of major interest and in related fields of biology. The major remaining requirement for the Ph.D. degree is the satisfactory completion of a dissertation consisting of original research carried out under the guidance of a faculty member.

Close collaboration with members of the Department of Chemistry and Biochemistry is a vital and stimulating aspect of the biology program. Additional strength and breadth in biology are gained by collaborating with the Department of Marine Biology of the Scripps Institution of Oceanography, with The Scripps Research Institute, and with the Salk Institute for Biological Studies.

Divisional Ph.D. Time Limit Policies

Students must be advanced to candidacy by the end of four years. Total university support cannot exceed seven years. Total registered time at UCSD cannot exceed seven years.

Specialization in Computational Neurobiology

Students interested in computational neurobiology may apply to the Division of Biological Sciences. Students in Biology with a Specialization in Computational Neurobiology are supported by the Institute for Neural Computation (INC). These young scientists are trained in the broad range of scientific and technical skills essential to understand the computational resources of neural systems. Students enrolled in this specialization receive financial support through a National Science Foundation (NSF) Integrative Graduate Education and Research Training (IGERT) award to UCSD.

Joint Doctoral Program with San Diego State University

The Division of Biological Sciences at UCSD participates in a joint graduate program with the Department of Biology at SDSU, primarily in the areas of cell and molecular biology, and leading to the Ph.D. degree in biology. Graduate student participants in the joint doctoral program are required to spend one year enrolled at UCSD; thesis research is carried out under the supervision of the SDSU faculty.

Information regarding admission is found in the current edition of the San Diego State University Graduate Bulletin.

COURSES

NOTE: The division will endeavor to offer the courses as outlined below; however, unforeseen circumstances sometimes mandate a change of scheduled offerings, especially the quarter offered (F,W,S). Students are strongly advised to check the Schedule of Classes or with the division's Student Affairs Office (1128 Pacific Hall, (858) 534-0557) before relying on the following schedule. This is of particular importance in planning schedules for graduation requirements. It is the student's responsibility to contact the Student Affairs Office to determine the specific quarter that certain courses will be offered. The following schedule is tentative for the academic year 2004–2005 only. It should not be assumed that the same schedule will continue after this academic year.

Students who have satisfied the prerequisites for courses at another college or by AP credit may need to be pre-authorized to register for the course. Please come to the Biology Student Affairs Office before your registration time to be authorized. If the class is full please place your name on the waitlist and attend the first class meeting.

Students who do not attend the first thirty minutes of the first scheduled meeting (be it lab or lecture) will be considered not enrolled in the course. Prior written notification to the instructor regarding an anticipated absence will ensure a space. However, responsibility for officially dropping the lab from the registrar's records belongs to the student.

IF A STUDENT DROPS A LAB COURSE AFTER THE END OF THE SECOND SESSION, THE DIVISION WILL REPORT A "W" FOR THE COURSE.

LOWER-DIVISION

BILD 1. The Cell (4)
An introduction to cellular structure and function, to biological molecules, bioenergetics, to the genetics of both procaryotic and eucaryotic organisms, and to the elements of molecular biology. Three hours of lecture and one hour of recitation. *Prerequisites: two quarters of general chemistry (second quarter of chemistry may be taken concurrently).* (F,W,S)

BILD 2. Multicellular Life (4)
An introduction to the development and the physiological processes of plants and animals. Included are treatments of reproduction, nutrition, respiration, transport systems, regulation of the internal environment, the nervous system, and behavior. Three hours of lecture and one hour of recitation. *Prerequisites: two quarters of general chemistry (Chem. 6A-B, second quarter of chemistry [Chem. 6B] may be taken concurrently.)* (F,W,S)

BILD 3. Organismic and Evolutionary Biology (4)
The first principles of evolutionary theory, classification, ecology, and behavior; a phylogenetic synopsis of

the major groups of organisms from viruses to primates. Three hours of lecture and one hour of lab. *Prerequisite: none.* Note: E.B.E. majors should complete this course during their first year at UCSD. (F,S)

BILD 7. The Beginning of Life (4)
An introduction to the basic principles of plant and animal development, emphasizing the similar strategies by which diverse organisms develop. Practical applications of developmental principles as well as ethical considerations arising from these technologies will be discussed. *Prerequisite: none.* (S)

BILD 10. Fundamental Concepts of Modern Biology (4)
An introduction to the biochemistry and genetics of cells and organisms; illustrations are drawn from microbiology and human biology. Three hours of lecture and one hour of discussion. This course is designed for non-biology students and does not satisfy a lower-division requirement for any biology major. Note: Students may not receive credit for BILD 10 after receiving credit for BILD 1. (F,W,S)

BILD 12. Neurobiology and Behavior (4)
An introduction to the organization and functions of the nervous system; topics include molecular, cellular, developmental, systems, and behavioral neurobiology. Three hours of lecture and one hour of discussion. This course is designed for non-biology students and does not satisfy a lower-division requirement for any biology major.

BILD 14. Introduction to Plant Biology (4)
Plant biology for non-majors with emphasis on human concerns. Plants as food for a growing population; plant growth, development and reproduction; the soil ecosystem; genetically engineered plants; organic farming; environmental concerns of agriculture. Three hours of lecture and one hour of discussion. This course is designed for non-biology students and does not satisfy a lower-division requirement for any biology major. Note: Students may not receive credit for BILD 14 after receiving credit for BICD 120.

BILD 16. History of Life (4)
Life has a very long history on earth and this course will chronicle patterns of biological diversity from its origin over 3 billion years ago to the present day. Topics covered will include methods for reconstructing the history of life on this planet, the origin and evolution of major groups of plants and animals, dinosaur paleobiology, past environmental changes and their effects on species and communities, and extinctions. We will also explore how insights from the past can be used to understand how present and future environmental changes will impact biological diversity. This course is designed for non-biology majors.

BILD 18. Human Impact on the Environment (4)
Course will focus on issues such as global warming, species extinction, and human impact on the oceans and forests. History and scientific projections will be examined in relation to these events. Possible solutions to these worldwide processes and a critical assessment of their causes and consequences will be covered. *Prerequisite: open to non-biology majors only.* (S)

BILD 20. Human Genetics in Modern Society (4)
Fundamentals of human genetics and introduction to modern genetic technology such as gene cloning and DNA finger printing. Applications of these techniques, such as forensic genetics, genetic screening, and genetic engineering. Social impacts and ethical implications of these applications. This course is designed for non-biology students and does not satisfy a lower-division requirement for any biology major. Note: Students may not receive credit for BILD 20 after receiving credit for BICD 100. (S)

BILD 22. Human Nutrition (4)
A survey of our understanding of the basic chemistry and biology of human nutrition; discussions of all aspects of food: nutritional value, diet, nutritional diseases, public health, and public policy. Three hours of lecture and one hour of discussion. This course is designed for non-biology students and does not satisfy a lower-division requirement for any biology major. Note: Students may not receive credit for BILD 22 after receiving credit for BIBC 120. (S)

BILD 24. Biology of Human Reproduction (4)
The topics covered are: sexual development in embryo and fetus, the nature and regulation of changes at puberty, the functioning of the mature sexual system. Three hours of lecture. This course is designed for non-biology students and does not satisfy a lower-division requirement for any biology major. Note: Students may not receive credit for BILD 24 after receiving credit for BICD 134. (W)

BILD 26. Human Physiology (4)
Introduction to the elements of human physiology and the functioning of the various organ systems. The course presents a broad, yet detailed, analysis of human physiology, with particular emphasis towards understanding disease processes. Three hours of lecture and one hour of discussion. This course is designed for non-biology students and does not satisfy a lower-division requirement for any biology major. (F)

BILD 30. The Biology of Plagues: Past and Present (4)
An introduction to diseases caused by viruses, bacteria, and parasites, and the impact of these diseases on human society. Topics include the biology of infectious disease, epidemiology, and promising new methods to fight disease. Three hours of lecture and one hour discussion. This course is designed for non-biology majors and does not satisfy a lower-division requirement for any biology major. (**Note:** Students may not receive credit for BILD 30 after receiving credit for BIMM 120.) (F)

BILD 32. Biomedicine/Cancer (4)
An introduction to molecular, cellular, and immunological aspects of cancer and a consideration of the sociological and psychological impact of cancer on the individual and general society. Three hours of lecture. This course is designed for non-biology students and does not satisfy a lower-division requirement for any biology major. Note: Students may not receive credit for BILD 32 after receiving credit for BIMM 134.

BILD 36. AIDS Science and Society (4)
An introduction to all aspects of the AIDS epidemic. Topics include the epidemiology, biology, and clinical aspects of HIV infection; HIV testing; education and approaches to therapy; and the social, political, and legal impacts of AIDS on the individual and society. In order to count for their major, biology majors must take the upper-division course, BICD 136. (W)

BILD 87. Freshman Seminar (1)
The freshman seminar program is designed to provide new students with the opportunity to explore an intellectual topic with a faculty member in a small seminar setting. Freshmen seminars are offered in all campus departments and undergraduate colleges, and topics vary from quarter to quarter. Enrollment is limited to fifteen to twenty students, with preference given to entering freshmen. (F,W,S)

BILD 90. Undergraduate Seminar (1)
This seminar is restricted to lower-division undergraduate students (freshmen and sophomores). The course introduces current biological topics. The topics vary with instructors and for each quarter. Examples of topics which may be discussed are: wildlife conservation, signalling within and between cells, mapping the human genome, etc. This course does not satisfy any requirement for the biology major, biology minor, or college general/education.

BILD 92. Professional Topics (1)
This seminar will introduce students to the various subdisciplines and their research methodology in the biological sciences. Emphasis will be on bioinformatics, neurophysiology, and biotechnology. Current research topics in the specialized areas in academe and industry will be discussed. The role and professional identity of biologists in research, consulting, government, management, and teaching will be reviewed. In addition, issues surrounding professional ethics will be discussed. (F)

BILD 94. Professional Issues in Bioinformatics (1)
This seminar will introduce undergraduate students, especially freshmen and sophomores, to a variety of issues and topics in the field of bioinformatics. (S)

BILD 95. Undergraduate Workshops (1)
The workshops will be restricted to lower-division undergraduates. The course will introduce students to the methods of scientific research and to a variety of research topics in the biological/biomedical sciences. Examples of topics are: Introduction to Scientific Research, AIDS, Medical and Social Aspects, Is the Mind the Same as the Brain, Wildlife Conservation.

UPPER-DIVISION

Biochemistry

BIBC 100. Structural Biochemistry (4)
The structure and function of biomolecules. Includes protein conformation, dynamics, and function; enzymatic catalysis, enzyme kinetics, and allosteric regulation; lipids and membranes; sugars and polysaccarides; and nucleic acids. Three hours of lecture and one hour of recitation. *Prerequisites: two quarters of organic chemistry (second quarter may be taken concurrently).* (Note: Students may not receive credit for both BIBC 100 and Chem. 114A.) (F,W,S)

BIBC 102. Metabolic Biochemistry (4)
Energy-producing pathways–glycolysis, the TCA cycle, oxidative phosphorylation, photosynthesis, and fatty acid oxidation; and biosynthetic pathways–gluconeogenesis, glycogen synthesis, and fatty acid biosynthesis. Nitrogen metabolism, urea cycle, amino acid metabolism, neucleotide metabolism, and metabolism of macromolecules. Three hours lecture and one hour recitation. *Prerequisites: two quarters of organic chemistry (second quarter may be taken concurrently).* Note: Students may not receive credit for both BIBC 102 and Chem. 114B.) (F,W,S)

BIBC 103. Biochemical Techniques (4)
Introductory laboratory course in current principles and techniques applicable to research problems in

biochemistry and molecular biology. Techniques include protein and nucleic acid purification; identification methods such as centrifugation, chromatography, and electrophoresis; immunological, spectrophotometric, and enzymatic methods. *Prerequisite: BILD 1.* Students may not receive credit for BIBC 103 after taking Chem. 112A. (F, W, S)

BIBC 105. Signal Transduction Laboratory (6)
A laboratory course involving the application of molecular, cellular, and biochemical techniques to explore signal transduction mechanisms in mammalian cells. The events between ligand-biding to a cell surface receptor and activation of gene transcription in the nucleus will be studied. *Prerequisites: BIBC 100, BIBC 103 and BIMM 100.*

BIBC 110. Physical Biochemistry (4)
The theory and applications of physical chemistry to biological molecules, process and systems and techniques used in biochemistry and physiology. Topics include reversible and irreversible thermodynamics, bioenergetics, energy coupling and transduction, solutions of macromolecules, sedimention, chromatography, electrophoresis, passive and active membrane transport, spectroscopy, and chemical kinetics. Three hours of lecture and one hour of recitation. *Prerequisites: calculus and organic chemistry.* (S)

BIBC 115. Computer Programming in Biology (4)
Use of computer programming in the analysis and presentation of biological data (computation of best value and standard deviation, histogram, least squares fitting procedure, simulation of genetic experiments, etc.) Students learn the C++ computer language and run their programs at the Computer Center. There are some visits to laboratories and hospitals to see applications of computers in biology and medicine. Three hours of lecture and about ten hours of homework per week; limited enrollment. *Prerequisite: upper-division standing or consent of instructor.* (**Note**: Students may not receive credit for both BIBC 115 and Chem. 134.)

BIBC 116 Evolution of Genes and Proteins (4)
The history of an organism can be found in its genome. analysis of the primary sequences will be used to recognize families of genes that arose by duplication and divergence. Topics include comparisons of amino acid sequences and three dimensional structures and range from the oldest and most widely distributed proteins to modem mosaics. Where possible, specific motifs and folds will be traced to their ancestral beginnings. *Prerequisites: BIBC 100, BIMM 100.* (W)

BIBC 120. Nutrition (4)
Emphasis is on the biochemical aspects of nutrition. The known functions of vitamins, minerals, fats, carbohydrates, and protein are discussed in terms of experiments in nutrition and an evaluation of the relation of the knowledge to nutrition in man. Three hours of lecture. *Prerequisite: BIBC 102 (may be taken concurrently).* (S)

BIBC 130 Marine Biochemistry (4)
Biochemical mechanisms of adaptation in organisms to the marine environment. Special emphasis will be on the effects of pressure, temperature, salinity, oxygen, and light on the physiology and biochemistry. *Prerequisites: BIBC 102 or consent of instructor.* (F)

Genetics, Cellular and Developmental Biology of Plants and Animals

BICD 100. Genetics (4)
An introduction to the principles of heredity in diploid organisms, fungi, bacteria, and viruses. Mendelian inheritance; population genetics; quantitative genetics; linkage; sex determination; meiotic behavior of chromosome aberrations, gene structure, regulation, and replication; genetic code. Three hours of lecture and one hour of recitation. *Prerequisite: BILD 1 or the equivalent.* (F,W,S)

BICD 101. Eucaryotic Genetics Laboratory (4)
This course emphasizes the principles of Mendelian inheritance and requires the student to apply both cytological and genetic analysis to the solution of problems in transmission genetics. One hour of lecture and seven hours of laboratory. *Prerequisite: BICD 100.* Attendance at the first lecture/lab is required. Non-attendance will result in the student's being dropped from the course roster. It is the student's responsibility to officially drop the course. (S)

BICD 110. Cell Biology (4)
The structure and function of cells and cell organelles, cell growth and division, motility, cell differentiation and specialization. Three hours of lecture and one hour of recitation. *Prerequisites: BIBC 100 or BIBC 102, and BICD 100.* (F,W,S)

BICD 111. Cell Biology Laboratory (4)
A laboratory course in the application of cellular techniques to biological problems. The establishment, growth, transformation, immortalization, and senescence of mammalian cells will be studied at the molecular and the cellular level. Ten hours of laboratory. In addition to the formal lab hours listed above, there will be an average of two hours in which students will be required to work in the class laboratory to complete experiments and prepare for presentations. *Prerequisite: BICD 110 (may be taken concurrently); BIBC 103 is strongly recommended.* (F) Attendance at the first lecture/lab is required. Non-attendance will result in the student's being dropped from the course roster. It is the student's responsibility to officially drop the course.

BICD 118. Pathways of Intracellular Protein Trafficking and Compartmentation (4)
This course will focus on various subcellular organelles, their function, protein traffic, disulfide bond formation, protein folding, assembly of macromolecular complexes, protein quality control, and cellular responses to misfolded proteins. The emphasis will be on experimental approaches and model systems for the analysis of these problems, and on the connection of these topics to human disease. Three hours of lecture and one hour of mandatory discussion of primary publications per week. Open to upper-division students only. *Prerequisites: BICD 110 and BIMM 100.* (W)

BICD 120. Fundamentals of Plant Biology (4)
An introduction to the biology of plants. Basic principles of plant anatomy, physiology, development, and diversity are covered as well as specialized topics, including plant genetic engineering, plant disease and stress, medicinal plants, plants and the environment, and sustainable agriculture. *Prerequisites: BILD 1 and 2.*

BICD 122. Plant Cellular and Molecular Biology (4)
The cellular and molecular basis of plant development, including plant hormones, signal transduction mechanisms, light and plant growth, plant microorganism interaction, plant transformation, genetic engineering of plants. *Prerequisite: BIBC 102 required.* (W)

BICD 123. Plant Molecular Genetics and Biotechnology Laboratory (6)
Techniques in plant cell and tissue culture, plant transformation, genetic selection and screening of mutants, host pathogen interactions, gene regulation, organelle isolation, membrane transport. Two hours of lecture and eight hours of laboratory each week. In addition to the formal lab hours, there will be at least eight hours in which students will be required to work in the class laboratory to complete experiments and prepare for presentations. *Prerequisites: upper-division standing; BICD 120 strongly recommended.* Attendance at the first lecture/lab is required. Non-attendance will result in the student's being dropped from the course roster. It is the student's responsibility to officially drop the course. (S)

BICD 130. Embryos, Genes, and Development (4)
Developmental biology of animals at the tissue, cellular, and molecular levels. Basic processes of embryogenesis in a variety of invertebrate and vertebrate organisms. Cellular and molecular mechanisms that underlie cell fate determination and cell differentiation. More advanced topics such as pattern formation and sex determination are discussed. Open to upper-division students only. Three hours of lecture and one hour of recitation. *Prerequisites: BICD 100, upper-division standing, BIBC 100 or BIBC 102; BICD 110 strongly recommended, BIMM 100 strongly recommended.* (W)

BICD 131. Embryology Laboratory (6)
Descriptive and experimental embryology of marine invertebrates and of vertebrates. One and one-half hours of lecture and ten hours of laboratory each week. In addition to the formal lab hours, there will be at least six and a half hours in which students will be required to work in the class laboratory to complete experiments and prepare for presentations. *Prerequisites: BILD 1; BILD 2 or BIPN 100.* Attendance at the first lecture/lab is required. Nonattendance will result in the student's being dropped from the course roster. It is the student's responsibility to officially drop the course. (F)

BICD 132. Molecular Basis of Development (4)
Explores the molecular mechanisms that underlie cell fate determination and cell differentiation during animal development. Emphasizes the action of key regulatory networks in directing developmental events in a variety of vertebrate and invertebrate systems. This course is open to upper-division students only. Three hours of lecture and one hour of recitation. *Prerequisites: BIMM 100, upper-division standing.*

BICD 133. Developmental Biology Lab (6)
Explore fundamentals of embryonic development using advanced techniques in light and fluorescent microscopy and by analyzing developmental mutants. Course includes selecting and knocking out genes of interest followed by phenotypic analysis. Invertebrate and vertebrate organisms covered. *Prerequisites: BILD 1; BILD 2 or BIPN 100; BIMM 100 and BIMM 110 are recommended.* Attendance at the first lecture/lab is required. Nonattendance will result in the student's being dropped from the course roster. It is the student's responsibility to officially drop the course.

BICD 134. Human Reproduction and Development (4)
This course is addressed to the development of the human sexual system, including gametogenesis, fertil-

the major groups of organisms from viruses to primates. Three hours of lecture and one hour of lab. *Prerequisite: none.* Note: E.B.E. majors should complete this course during their first year at UCSD. (F,S)

BILD 7. The Beginning of Life (4)
An introduction to the basic principles of plant and animal development, emphasizing the similar strategies by which diverse organisms develop. Practical applications of developmental principles as well as ethical considerations arising from these technologies will be discussed. *Prerequisite: none.* (S)

BILD 10. Fundamental Concepts of Modern Biology (4)
An introduction to the biochemistry and genetics of cells and organisms; illustrations are drawn from microbiology and human biology. Three hours of lecture and one hour of discussion. This course is designed for non-biology students and does not satisfy a lower-division requirement for any biology major. Note: Students may not receive credit for BILD 10 after receiving credit for BILD 1. (F,W,S)

BILD 12. Neurobiology and Behavior (4)
An introduction to the organization and functions of the nervous system; topics include molecular, cellular, developmental, systems, and behavioral neurobiology. Three hours of lecture and one hour of discussion. This course is designed for non-biology students and does not satisfy a lower-division requirement for any biology major.

BILD 14. Introduction to Plant Biology (4)
Plant biology for non-majors with emphasis on human concerns. Plants as food for a growing population; plant growth, development and reproduction; the soil ecosystem; genetically engineered plants; organic farming; environmental concerns of agriculture. Three hours of lecture and one hour of discussion. This course is designed for non-biology students and does not satisfy a lower-division requirement for any biology major. Note: Students may not receive credit for BILD 14 after receiving credit for BICD 120.

BILD 16. History of Life (4)
Life has a very long history on earth and this course will chronicle patterns of biological diversity from its origin over 3 billion years ago to the present day. Topics covered will include methods for reconstructing the history of life on this planet, the origin and evolution of major groups of plants and animals, dinosaur paleobiology, past environmental changes and their effects on species and communities, and extinctions. We will also explore how insights from the past can be used to understand how present and future environmental changes will impact biological diversity. This course is designed for non-biology majors.

BILD 18. Human Impact on the Environment (4)
Course will focus on issues such as global warming, species extinction, and human impact on the oceans and forests. History and scientific projections will be examined in relation to these events. Possible solutions to these worldwide processes and a critical assessment of their causes and consequences will be covered. *Prerequisite: open to non-biology majors only.* (S)

BILD 20. Human Genetics in Modern Society (4)
Fundamentals of human genetics and introduction to modern genetic technology such as gene cloning and DNA finger printing. Applications of these techniques, such as forensic genetics, genetic screening, and genetic engineering. Social impacts and ethical implications of these applications. This course is designed for non-biology students and does not satisfy a lower-division requirement for any biology major. Note: Students may not receive credit for BILD 20 after receiving credit for BICD 100. (S)

BILD 22. Human Nutrition (4)
A survey of our understanding of the basic chemistry and biology of human nutrition; discussions of all aspects of food: nutritional value, diet, nutritional diseases, public health, and public policy. Three hours of lecture and one hour of discussion. This course is designed for non-biology students and does not satisfy a lower-division requirement for any biology major. Note: Students may not receive credit for BILD 22 after receiving credit for BIBC 120. (S)

BILD 24. Biology of Human Reproduction (4)
The topics covered are: sexual development in embryo and fetus, the nature and regulation of changes at puberty, the functioning of the mature sexual system. Three hours of lecture. This course is designed for non-biology students and does not satisfy a lower-division requirement for any biology major. Note: Students may not receive credit for BILD 24 after receiving credit for BICD 134. (W)

BILD 26. Human Physiology (4)
Introduction to the elements of human physiology and the functioning of the various organ systems. The course presents a broad, yet detailed, analysis of human physiology, with particular emphasis towards understanding disease processes. Three hours of lecture and one hour of discussion. This course is designed for non-biology students and does not satisfy a lower-division requirement for any biology major. (F)

BILD 30. The Biology of Plagues: Past and Present (4)
An introduction to diseases caused by viruses, bacteria, and parasites, and the impact of these diseases on human society. Topics include the biology of infectious disease, epidemiology, and promising new methods to fight disease. Three hours of lecture and one hour discussion. This course is designed for non-biology majors and does not satisfy a lower-division requirement for any biology major. (**Note:** Students may not receive credit for BILD 30 after receiving credit for BIMM 120.) (F)

BILD 32. Biomedicine/Cancer (4)
An introduction to molecular, cellular, and immunological aspects of cancer and a consideration of the sociological and psychological impact of cancer on the individual and general society. Three hours of lecture. This course is designed for non-biology students and does not satisfy a lower-division requirement for any biology major. Note: Students may not receive credit for BILD 32 after receiving credit for BIMM 134.

BILD 36. AIDS Science and Society (4)
An introduction to all aspects of the AIDS epidemic. Topics include the epidemiology, biology, and clinical aspects of HIV infection; HIV testing; education and approaches to therapy; and the social, political, and legal impacts of AIDS on the individual and society. In order to count for their major, biology majors must take the upper-division course, BICD 136. (W)

BILD 87. Freshman Seminar (1)
The freshman seminar program is designed to provide new students with the opportunity to explore an intellectual topic with a faculty member in a small seminar setting. Freshmen seminars are offered in all campus departments and undergraduate colleges, and topics vary from quarter to quarter. Enrollment is limited to fifteen to twenty students, with preference given to entering freshmen. (F,W,S)

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This seminar is restricted to lower-division undergraduate students (freshmen and sophomores). The course introduces current biological topics. The topics vary with instructors and for each quarter. Examples of topics which may be discussed are: wildlife conservation, signalling within and between cells, mapping the human genome, etc. This course does not satisfy any requirement for the biology major, biology minor, or college general/education.

BILD 92. Professional Topics (1)
This seminar will introduce students to the various subdisciplines and their research methodology in the biological sciences. Emphasis will be on bioinformatics, neurophysiology, and biotechnology. Current research topics in the specialized areas in academe and industry will be discussed. The role and professional identity of biologists in research, consulting, government, management, and teaching will be reviewed. In addition, issues surrounding professional ethics will be discussed. (F)

BILD 94. Professional Issues in Bioinformatics (1)
This seminar will introduce undergraduate students, especially freshmen and sophomores, to a variety of issues and topics in the field of bioinformatics. (S)

BILD 95. Undergraduate Workshops (1)
The workshops will be restricted to lower-division undergraduates. The course will introduce students to the methods of scientific research and to a variety of research topics in the biological/biomedical sciences. Examples of topics are: Introduction to Scientific Research, AIDS, Medical and Social Aspects, Is the Mind the Same as the Brain, Wildlife Conservation.

UPPER-DIVISION

Biochemistry

BIBC 100. Structural Biochemistry (4)
The structure and function of biomolecules. Includes protein conformation, dynamics, and function; enzymatic catalysis, enzyme kinetics, and allosteric regulation; lipids and membranes; sugars and polysaccarides; and nucleic acids. Three hours of lecture and one hour of recitation. *Prerequisites: two quarters of organic chemistry (second quarter may be taken concurrently).* (Note: Students may not receive credit for both BIBC 100 and Chem. 114A.) (F,W,S)

BIBC 102. Metabolic Biochemistry (4)
Energy-producing pathways–glycolysis, the TCA cycle, oxidative phosphorylation, photosynthesis, and fatty acid oxidation; and biosynthetic pathways–gluconeogenesis, glycogen synthesis, and fatty acid biosynthesis. Nitrogen metabolism, urea cycle, amino acid metabolism, neucleotide metabolism, and metabolism of macromolecules. Three hours lecture and one hour recitation. *Prerequisites: two quarters of organic chemistry (second quarter may be taken concurrently).* Note: Students may not receive credit for both BIBC 102 and Chem. 114B.) (F,W,S)

BIBC 103. Biochemical Techniques (4)
Introductory laboratory course in current principles and techniques applicable to research problems in

biochemistry and molecular biology. Techniques include protein and nucleic acid purification; identification methods such as centrifugation, chromatography, and electrophoresis; immunological, spectrophotometric, and enzymatic methods. *Prerequisite: BILD 1.* Students may not receive credit for BIBC 103 after taking Chem. 112A. (F, W, S)

BIBC 105. Signal Transduction Laboratory (6)
A laboratory course involving the application of molecular, cellular, and biochemical techniques to explore signal transduction mechanisms in mammalian cells. The events between ligand-biding to a cell surface receptor and activation of gene transcription in the nucleus will be studied. *Prerequisites: BIBC 100, BIBC 103 and BIMM 100.*

BIBC 110. Physical Biochemistry (4)
The theory and applications of physical chemistry to biological molecules, process and systems and techniques used in biochemistry and physiology. Topics include reversible and irreversible thermodynamics, bioenergetics, energy coupling and transduction, solutions of macromolecules, sedimention, chromatography, electrophoresis, passive and active membrane transport, spectroscopy, and chemical kinetics. Three hours of lecture and one hour of recitation. *Prerequisites: calculus and organic chemistry.* (S)

BIBC 115. Computer Programming in Biology (4)
Use of computer programming in the analysis and presentation of biological data (computation of best value and standard deviation, histogram, least squares fitting procedure, simulation of genetic experiments, etc.) Students learn the C++ computer language and run their programs at the Computer Center. There are some visits to laboratories and hospitals to see applications of computers in biology and medicine. Three hours of lecture and about ten hours of homework per week; limited enrollment. *Prerequisite: upper-division standing or consent of instructor.* (**Note**: Students may not receive credit for both BIBC 115 and Chem. 134.)

BIBC 116 Evolution of Genes and Proteins (4)
The history of an organism can be found in its genome. analysis of the primary sequences will be used to recognize families of genes that arose by duplication and divergence. Topics include comparisons of amino acid sequences and three dimensional structures and range from the oldest and most widely distributed proteins to modem mosaics. Where possible, specific motifs and folds will be traced to their ancestral beginnings. *Prerequisites: BIBC 100, BIMM 100.* (W)

BIBC 120. Nutrition (4)
Emphasis is on the biochemical aspects of nutrition. The known functions of vitamins, minerals, fats, carbohydrates, and protein are discussed in terms of experiments in nutrition and an evaluation of the relation of the knowledge to nutrition in man. Three hours of lecture. *Prerequisite: BIBC 102 (may be taken concurrently).* (S)

BIBC 130 Marine Biochemistry (4)
Biochemical mechanisms of adaptation in organisms to the marine environment. Special emphasis will be on the effects of pressure, temperature, salinity, oxygen, and light on the physiology and biochemistry. *Prerequisites: BIBC 102 or consent of instructor.* (F)

Genetics, Cellular and Developmental Biology of Plants and Animals

BICD 100. Genetics (4)
An introduction to the principles of heredity in diploid organisms, fungi, bacteria, and viruses. Mendelian inheritance; population genetics; quantitative genetics; linkage; sex determination; meiotic behavior of chromosome aberrations, gene structure, regulation, and replication; genetic code. Three hours of lecture and one hour of recitation. *Prerequisite: BILD 1 or the equivalent.* (F,W,S)

BICD 101. Eucaryotic Genetics Laboratory (4)
This course emphasizes the principles of Mendelian inheritance and requires the student to apply both cytological and genetic analysis to the solution of problems in transmission genetics. One hour of lecture and seven hours of laboratory. *Prerequisite: BICD 100.* Attendance at the first lecture/lab is required. Non-attendance will result in the student's being dropped from the course roster. It is the student's responsibility to officially drop the course. (S)

BICD 110. Cell Biology (4)
The structure and function of cells and cell organelles, cell growth and division, motility, cell differentiation and specialization. Three hours of lecture and one hour of recitation. *Prerequisites: BIBC 100 or BIBC 102, and BICD 100.* (F,W,S)

BICD 111. Cell Biology Laboratory (4)
A laboratory course in the application of cellular techniques to biological problems. The establishment, growth, transformation, immortalization, and senescence of mammalian cells will be studied at the molecular and the cellular level. Ten hours of laboratory. In addition to the formal lab hours listed above, there will be an average of two hours in which students will be required to work in the class laboratory to complete experiments and prepare for presentations. *Prerequisite: BICD 110 (may be taken concurrently); BIBC 103 is strongly recommended.* (F) Attendance at the first lecture/lab is required. Non-attendance will result in the student's being dropped from the course roster. It is the student's responsibility to officially drop the course.

BICD 118. Pathways of Intracellular Protein Trafficking and Compartmentation (4)
This course will focus on various subcellular organelles, their function, protein traffic, disulfide bond formation, protein folding, assembly of macromolecular complexes, protein quality control, and cellular responses to misfolded proteins. The emphasis will be on experimental approaches and model systems for the analysis of these problems, and on the connection of these topics to human disease. Three hours of lecture and one hour of mandatory discussion of primary publications per week. Open to upper-division students only. *Prerequisites: BICD 110 and BIMM 100.* (W)

BICD 120. Fundamentals of Plant Biology (4)
An introduction to the biology of plants. Basic principles of plant anatomy, physiology, development, and diversity are covered as well as specialized topics, including plant genetic engineering, plant disease and stress, medicinal plants, plants and the environment, and sustainable agriculture. *Prerequisites: BILD 1 and 2.*

BICD 122. Plant Cellular and Molecular Biology (4)
The cellular and molecular basis of plant development, including plant hormones, signal transduction mechanisms, light and plant growth, plant microorganism interaction, plant transformation, genetic engineering of plants. *Prerequisite: BIBC 102 required.* (W)

BICD 123. Plant Molecular Genetics and Biotechnology Laboratory (6)
Techniques in plant cell and tissue culture, plant transformation, genetic selection and screening of mutants, host pathogen interactions, gene regulation, organelle isolation, membrane transport. Two hours of lecture and eight hours of laboratory each week. In addition to the formal lab hours, there will be at least eight hours in which students will be required to work in the class laboratory to complete experiments and prepare for presentations. *Prerequisites: upper-division standing; BICD 120 strongly recommended.* Attendance at the first lecture/lab is required. Non-attendance will result in the student's being dropped from the course roster. It is the student's responsibility to officially drop the course. (S)

BICD 130. Embryos, Genes, and Development (4)
Developmental biology of animals at the tissue, cellular, and molecular levels. Basic processes of embryogenesis in a variety of invertebrate and vertebrate organisms. Cellular and molecular mechanisms that underlie cell fate determination and cell differentiation. More advanced topics such as pattern formation and sex determination are discussed. Open to upper-division students only. Three hours of lecture and one hour of recitation. *Prerequisites: BICD 100, upper-division standing, BIBC 100 or BIBC 102; BICD 110 strongly recommended, BIMM 100 strongly recommended.* (W)

BICD 131. Embryology Laboratory (6)
Descriptive and experimental embryology of marine invertebrates and of vertebrates. One and one-half hours of lecture and ten hours of laboratory each week. In addition to the formal lab hours, there will be at least six and a half hours in which students will be required to work in the class laboratory to complete experiments and prepare for presentations. *Prerequisites: BILD 1; BILD 2 or BIPN 100.* Attendance at the first lecture/lab is required. Nonattendance will result in the student's being dropped from the course roster. It is the student's responsibility to officially drop the course. (F)

BICD 132. Molecular Basis of Development (4)
Explores the molecular mechanisms that underlie cell fate determination and cell differentiation during animal development. Emphasizes the action of key regulatory networks in directing developmental events in a variety of vertebrate and invertebrate systems. This course is open to upper-division students only. Three hours of lecture and one hour of recitation. *Prerequisites: BIMM 100, upper-division standing.*

BICD 133. Developmental Biology Lab (6)
Explore fundamentals of embryonic development using advanced techniques in light and fluorescent microscopy and by analyzing developmental mutants. Course includes selecting and knocking out genes of interest followed by phenotypic analysis. Invertebrate and vertebrate organisms covered. *Prerequisites: BILD 1; BILD 2 or BIPN 100; BIMM 100 and BIMM 110 are recommended.* Attendance at the first lecture/lab is required. Nonattendance will result in the student's being dropped from the course roster. It is the student's responsibility to officially drop the course.

BICD 134. Human Reproduction and Development (4)
This course is addressed to the development of the human sexual system, including gametogenesis, fertil-

ization, and embryo implantation. Emphasis is placed on the physiology of reproductive functions. Three hours of lecture and one hour of discussion. *Prerequisites: BIBC 102 and BICD 100.* (F)

BICD 136. AIDS Science and Society (4)
An introduction to all aspects of the AIDS epidemic. Topics will include the epidemiology, biology, and clinical aspects of HIV infection, HIV testing, education and approaches to therapy, and the social, political, and legal impacts of AIDS on the individual and society. In order to count for their major, biology majors must take the upper-division course, BICD 136. *Prerequisites: BILD 1, BILD 2 recommended.* (F)

BICD 140. Immunology (4)
Formation and function of the mammalian immune system, molecular and cellular basis of the immune response, infectious diseases and autoimmunity. *Prerequisites: BICD 100, BIMM 100. BIBC 100 recommended.* (F,W)

BICD 142. Topics in Immunology (4)
This course covers selected topics in molecular and cellular immunology at a more advanced level, and is a sequel to Immunology (BICD 140). *Prerequisites: BICD 140 and upper-division standing.* (S)

BICD 145 Laboratory in Molecular Medicine (4)
This course focuses upon a molecular and immunological approach to study problems in modern medical research. The emphasis will be on novel approaches in medicine, including lymphocyte biology, cancer biology, and gene transfer. *Prerequisites: BIBC 103, BIMM 100.* Attendance at the first lecture/lab is required. Nonattendance will result in the student's being dropped from the course roster. It is the student's responsibility to officially drop the course.

BICD 150. Endocrinology (4)
Topics are normal function and diseases of the major hormone systems of the body including the hypothalamus/pituitary axis, the thyroid gland, reproduction and sexual development, metabolism and the pancreas, bone and calcium metabolism, and the adrenal glands. *Prerequisite: BIPN 100 (may be taken concurrently).* (F)

BICD 162. Critical Reading and Writing in the Biological Sciences (4)
Primary literature readings in the field of cell transport on how to approach a scientific paper, how to interpret results, and how to write a paper that summarizes scientific research. *Prerequisites: Chem. 140A, 140B; either BIBC 100 or BIBC 102; BIMM 100; BICD 110 is recommended; one laboratory course (BIBC 103 or BIMM 101 or BIMM 121 or BIPN 105) or other example of research experience (BISP 199 or research experience in industry).* (F)

BICD 170. Topics in Human Genetics (4)
An advanced course covering aspects of human genetics in detail and using papers from the scientific literature as the major source of information. A review of basic genetics as applied to the human species is followed by the consideration of recent genetic insights into a number of human conditions which illustrate the principles covered in the first part of the course. *Prerequisites: BICD 100 (may not be taken concurrently), BIMM 100 is strongly recommended.* (S)

BICD 180. Genetics of Model Organisms (4)
Survey of various organisms used in current biological/biomedical research. Biology faculty experts discuss organisms used in their research, outline history as genetic models, tools used for laboratory study, and contributions to the wider understanding of biological systems. *Prerequisite: BICD 100.* (S)

Ecology, Behavior, and Evolution

BIEB 100. Biometry (4)
Application of statistics in biological problems. Topics: parametric statistics, (t-test, correlation, regression, ANOVA), non-parametric statistics resampling methods, experimental design. Mandatory homework to apply theory using statistical Macintosh-based programs. Instructor conducts mandatory two-hour discussion session in computer lab. Three hours of lecture and two hours of laboratory section. *Prerequisite: BILD 3 recommended.* (F,W)

BIEB 102. Introductory Ecology-Organisms and Habitat (4)
This course emphasizes principles shaping organisms, habitats, and ecosystems. Topics covered include population regulation, physiological ecology, competition, predation, and human exploitation. This will be an empirical look at general principles in ecology and conservation with emphasis on the unique organisms and habitats of California. *Prerequisite: BILD 3 or equivalent.* (W)

BIEB 121. Ecology Laboratory (6)
A laboratory course to familiarize students with ecological problem solving and methods. Sections will use the Macintosh computer and also perform outdoor field work. Two hours of lecture and eight hours of laboratory each week. In addition to the formal lab hours, there will be at least nine hours in which students will be required to work in the class laboratory to complete experiments and prepare for presentations. *Prerequisites: BIEB 100.* (S)

BIEB 126. Plant Ecology (4)
This course begins with an introduction to plant population biology including whole-plant growth and physiology. We then focus on three classes of ecological interactions: plant-plant competition, plant-herbivore coevolution, and plant reproductive ecology including animal pollination and seed dispersal. *Prerequisite: BILD 3.* (S)

BIEB 128. Insect Ecology (4)
This course begins with a survey of insect diversity and phylogenetic relationships. We then address ecological issues including thermal ecology, population dynamics (including outbreaks), movement and migration, competition, predation, herbivory, parasitism, insect defense, mimicry complexes, and sociality. *Prerequisite: BILD 3 or equivalent.* (W)

BIEB 130. Introductory Marine Ecology (4)
An introduction to the marine environment–its physics and chemistry, the organisms which live there, and the ecological processes affecting the distributions and abundances of these organisms. *Prerequisites: BILD 3, high school physics, and chemistry.*

BIEB 131. Marine Invertebrate Ecology Laboratory (6)
A laboratory course introducing students to marine ecology. Students will participate in outdoor fieldwork and work in the laboratory gathering and analyzing ecological data. We will focus on ecological communities in estuary, sandy beach, and rocky intertidal habitats. Two hours of lecture and eight hours of laboratory each week. In addition to the formal lab hours, there will be at least nine hours in which students will be required to work in the class laboratory to complete experiments and prepare for presentations. *Prerequisite: BILD 3; BIEB 100.* (W)

BIEB 132. Introduction to Marine Biology (4)
Overview of marine organisms and their adaptations to sea life. Selected examples of physiological, behavioral, and evolutionary adaptations in response to the unique challenges of a maritime environment. *Prerequisite: BILD 3.* (W)

BIEB 134. Introduction to Biological Oceanography (4)
Basis for understanding the ecology of marine communities. The approach is process-oriented, focusing on major functional groups of organisms, their food-web interactions and community responses to environmental forcing, and contemporary issues in human and climate influences. *Prerequisite: upper-division standing; BILD 3 is recommended.* (S)

BIEB 140. Biodiversity (4)
An introduction to the patterns of geographic distribution and natural history of plants and animals living in terrestrial and marine ecosystems. We will explore: ecological and evolutionary processes responsible for generating and maintaining biological diversity; and the nature of extinction both in past and present ecosystem. *Prerequisite: BILD 3.* (S)

BIEB 144. Quantitative Ecology (4)
This course introduces students to the methods and mathematical and computational tools used to make quantitative predictions of outcomes for ecological systems. Subjects covered include: stage-structured population growth; population regulation; the exploitation of natural resources; predator-prey and host/parasite dynamics; competition; and metapopulation dynamics. *Prerequisite: BILD 3 or equivalent and BIEB 100.*

BIEB 150. Evolution (4)
Evolutionary processes are discussed in their genetic, historical, and ecological contexts. Microevolution, speciation, macroevolution, and the evolution of adaptations. Three hours of lecture and one hour of recitation. *Prerequisite: BILD 3 or equivalent.* (W)

BIEB 154. Molecular Evolution (4)
This course deals with the evolution of genes and the molecules they encode. The role of mutation, selection, and drift at the molecular level are discussed. Molecular phylogenies, jumping genes, viral evolution, and searches for molecular homologies are a few of the topics covered. Three hours of lecture and one hour of discussion. *Prerequisites: BIBC 102, BICD 100, and BIMM 100 recommended.* (S)

BIEB 156. Population Genetics (4)
The first two-thirds of the course will cover the basic theory of population genetics, including selection, genetic drift, mutation, and migration. The last one-third of the course provides an introduction to quantitative genetics, including measurements of heritability and selection. The theory is illustrated throughout with biological examples. *Prerequisite: BICD 100. BIEB 100 is recommended.* (F)

BIEB 164. Behavioral Ecology (4)
A survey of the patterns of social behavior in animals and a discussion of the ecological principles underlying the evolution of animal societies. Three hours of lecture and one hour of discussion. *Prerequisite: BILD 3 recommended.* (W)

BIEB 165. Behavioral Ecology Laboratory (6)
This course will deal with quantitative methods for the study of animal social behaviors. Topics include spatial patterns, mating systems, and cooperation. The course

includes both lab exercises and field trips. Two hours of lecture and eight hours of laboratory each week. In addition to the formal lab hours, there will be at least nine hours in which students will be required to work in the class laboratory to complete experiments and prepare for presentations. *Prerequisites: BIEB 100 and BIEB 164. (BIEB 164 may be taken concurrently.)* (W)

BIEB 166. Animal Behavior and Communication (4)
An integrated approach to animal behavior focusing on mechanisms of acoustic, visual, and olfactory communication. Course covers ethology and the genetics and neurobiology of behavior; orientation and navigation; and signal origins, properties, design, and evolution. *Prerequisite: BILD 3 recommended, but not required; Physics 1A or equivalent.* (S)

BIEB 167. Animal Communication Laboratory (6)
Laboratory exercises will introduce students to quantitative methods of visual, auditory, and olfactory signal analysis and to lab and field studies of animal signalling. Two hours of lecture and eight hours of laboratory each week. In addition to the formal lab hours, there will be at least nine hours in which students will be required to work in the class laboratory to complete experiments and prepare for presentations. *Prerequisites: BIEB 100 and BIEB 166. (BIEB 166 may be taken concurrently.)*

BIEB 170. Applied Remote Sensing (4)
Provides a working knowledge of remote sensing with emphasis on understanding the underlying concepts involved in the interaction of the electromagnetic spectrum and the natural world. May be taken only as part of the White Mountain Research "Integrated Methods in Ecology." *Prerequisites: consent of instructor; 3.0 GPA; departmental stamp.* For more information, consult http://www.wmrs.edu

BIEB 171. Landscape Analysis (4)
Introduces perspectives on biological scales and levels of organization on how these concepts interrelate, and how they can be quantified and used for effective management. May be taken only as part of the White Mountain Research "Integrated Methods in Ecology." *Prerequisites: consent of instructor; 3.0 GPA; departmental stamp.* For more information, consult http://www.wmrs.edu

BIEB 172. Scientific Inquiry in Ecosystem Analysis (4)
Designed to integrate remote sensing and landscape analysis with policy and management of natural resources in the western U.S. to foster student professional development. May be taken only as part of the White Mountain Research "Integrated Methods in Ecology." *Prerequisites: consent of instructor; 3.0 GPA; departmental stamp.* For more information, consult http://www.wmrs.edu

BIEB 176. Conservation and the Human Predicament (4)
(Cross-listed with ANTH/BIO 132; however, biology majors must take the course as Biology 176.) An interdisciplinary discussion of the human predicament, the biodiversity crisis, and the importance of biological and environmental conservation in sustaining future societies. We explore the consequences of habitat destruction and species extinctions on the biosphere and human welfare. Three hours of lecture and one hour of discussion. *Prerequisite: upper-division standing and BILD 3 or consent of instructor.* (S)

BIEB 178. Principles of Conservation Ecology (4)
Biodiversity will ultimately be preserved in "islands" of natural habitat. The principles of community ecology, island biogeography, and metropopulation dynamics will underlay the management decisions regarding the number, size, and locations of such reserves. Case studies are emphasized. *Prerequisite: BIEB 100.*

BIEB 179. Conservation Biology Laboratory (6)
Students will utilize, modify, and create computer software to solve conservation biology management problems. Topics included are pedigree analysis, stochastic population dynamics, community structure, and island biogeography. Two hours of lecture and eight hours of laboratory each week. In addition to the formal lab hours, there will be at least seven hours in which students will be required to work in the class laboratory to complete experiments and prepare for presentations. *Prerequisite: BIEB 178 or BIEB 180 (may be taken concurrently).*

BIEB 180. Principle of Conservation Genetics (4)
Species preservation depends on the maintenance of genetic diversity, which involves many aspects of population bahavior. Inbreeding, heterozygosity loss, genetic divergence, and pedigree analysis are emphasized. Case studies involve zoo and reserve managment.

Molecular Biology, Microbiology

BIMM 100. Molecular Biology (4)
Molecular basis of biological processes, emphasizing gene action in context of entire genome. Chromosomes and DNA metabolism: chromatin, DNA replication, repair, mutation, recombination, transposition. Transcription, protein synthesis, regulation of gene activity. Procaryotes and eucaryotes *Prerequisites: BIBC 100 or BIBC 102, BICD 100.* (**Note**: Students may not receive credit for both BIMM 100 and Chem. 114C.) (F,W,S)

BIMM 101. Recombinant DNA Techniques (4)
Theory and practice of DNA cloning. This course aims at providing practical knowledge in the field of genetic engineering. Techniques covered include construction of plasmid and phage DNA libraries, screening libraries for desired DNA clones by hybridization methods, plasmid and phage DNA preparation, and DNA sequencing. Two hours of lecture, one hour of discussion, and eight hours of laboratory. *Prerequisite: BIMM 100.* Attendance at the first lecture/lab is required. Non-attendance will result in the student's being dropped from the course roster. It is the student's responsibility to officially drop the course. **Note**: Students may not receive credit for both BIMM 101 and Chem. 112B. (F,W,S)

BIMM 103. Modern Techniques in Molecular Biology (4)
This course focuses upon a combined biochemical and molecular genetic approach to study current biological problems. Techniques include amplification of rare nucleic acids with the polymerase chain reaction, purification and characterization of a eukaryotic protein expressed in bacteria, in vitro mutagenesis of DNA. One hour of lecture and eleven hours of laboratory. *Prerequisites: BIBC 103, BIMM 100.* Attendance at the first lecture/lab is required. Non-attendance will result in the student's being dropped from the course roster. It is the student's responsibility to officially drop the course.

BIMM 108. Chromatin Structure and Dynamics (4)
Chromatin is the natural state of DNA in the eukaryotic nucleus. Chromatin structure, nucleosome assembly, chromatin remodeling by ATP-dependent motor proteins, histone modifications and the histone code, heterochromatin, and the influence of chromatin upon DNA-directed processes in the nucleus will be discussed. *Prerequisite: BIMM 100.* (S)

BIMM 110. Molecular Basis of Human Disease (4)
An examination of the molecular basis of human diseases. Course emphasizes inherited human disorders, and some important diseases caused by viruses. Focus on the application of genetic, biochemical, and molecular biological principles to an understanding of the diseases. Three hours of lecture. Course restricted to upper-division biology majors. *Prerequisites: BICD 100; BIBC 102; BIMM 100.* (S)

BIMM 112. Regulation of Gene Activity in Eucaryotic Cells (4)
This course explores problems in the regulation of gene activity in eucaryotic cells approached at the molecular level. The course includes the organization, structure, transcription, and regulation of eucaryotic genes; mechanism of hormonal regulation in controlling gene activity; induction of gene expression in eucaryotic cells; role of signal transduction in controlling gene expression; and regulation of gene activity during differentiation in developing systems. Examples are taken from eucaryotic microorganisms, invertebrates, as well as mammalian and other vertebrate systems. Three hours of lecture and one hour of discussion. *Prerequisite: BIMM 100.* (S)

BIMM 114. Virology (4)
An introduction to eucaryotic virology, with emphasis on animal virus systems. Topics discussed include the molecular structure of viruses; the multiplication strategies of the major virus families; and viral latency, persistence, and oncology. Three hours of lecture and one hour of discussion. *Prerequisite: BIMM 100.* (S)

BIMM 116. Circadian Rhythms—Biological Clocks (4)
Examples and fundamental properties of the daily biological clock in humans, animals, and microbes. Experimental approaches employed to understand how organisms keep time and how this applies to human health. *Prerequisite: BILD 1 or Psych. 106 or consent of instructor.* (F)

BIMM 118. Pharmacology (4)
Basics of pharmacology such as drug absorption, distribution, metabolism, and elimination. Concepts in toxicology and pharmacognosy are used to survey the major drug categories. *Prerequisites BIBC 100 or BIBC 102; BIPN 100.* (S)

BIMM 120. Bacteriology (4)
A discussion of the structure, growth, molecular genetics, and physiology of procaryotic microorganisms, with emphasis on the diverse activities of bacteria and on the interaction of various bacterial species with their environment. Three hours of lecture and one hour recitation. *Prerequisites: organic chemistry; BIBC 100 or BIBC 102 (may be taken concurrently).* (F,W)

BIMM 121. Laboratory in Microbiology (4)
This course emphasizes fundamental principles of microbiology. Studies with bacteria include comparative morphology and physiology; pure culture techniques; bacterial growth; spore germination; and bacteriophage infection, replication, and release. Additional studies on antibiotics and the use of bioassays are included. One hour of demonstration and seven hours of laboratory. *Prerequisites: BIMM 120, may be taken concurrently, and consent of instructor.* Attendance at the first lecture/lab is required. Nonattendance will result in the student's being dropped from the course roster. It is the student's responsibility

to officially drop the course at the Registrar's Office. (F,W,S)

BIMM 122. Microbial Genetics (4)
Organization and function of procaryotic genetic systems including sex factors, transduction, transformation, phage genetics, transposons, genetic engineering. Three hours of lecture. *Prerequisites: BIMM 100, BICD 100, or consent of instructor.* (W)

BIMM 124. Medical Microbiology (4)
This course covers basic principles and detailed aspects of microbial infectious diseases. Biochemical properties underlying microbial spread, host antimicrobial and inflammatory response, immunity, and recovery are emphasized. Emphasis is placed upon viral and bacterial diseases, including molecular principles of pathogenesis, of host immune responses, of drug resistance, and of viral and plasmid replication. Three hours of lecture and one hour of discussion. *Prerequisites: BIMM 100 and 120, BICD 140 is recommended.* (W)

BIMM 126. Environmental Microbiology (4)
The role of microorganisms in environmental processes; fundamental aspects of Microbiology, interaction of microbes with plants, animals and other microbes, biogeochemical cycles, pollution, water quality, mineral recovery, biomass energy production, microbial control of pest and disease, genetic exchange. *Prerequisites: BIBC 102 (may be taken concurrently), and BIMM 120 recommended or consent of instructor.* (W)

BIMM 127. Environmental Microbiology Laboratory (4)
This course emphasizes advanced techniques and theory in environmental microbiology. Students will perform experiments concerning: (a) enrichment of diverse microbes, (b) microbial enumeration and identification, (c) metabolic and physiochemical adaptations, and (d) biotechnology, along with an independent project. *Prerequisites: BIMM 121 and BIMM 126 or consent of instructor.*

BIMM 130. Microbial Physiology (4)
Prokaryotic microbial physiology will be discussed primarily from a biochemical standpoint with emphasis on mechanism. Topics will vary from year to year but will include the following themes: Central metabolism, bioenergetics, biosynthesis, regulation, differentiation, prokaryotic structure-function relationships. *Prerequisites: BIBC 100 or BIBC 102 or equivalent.* (S)

BIMM 132. Molecular Biology of Human Retroviruses (4)
Replication cycle and gene regulation of HIV. Molecular approaches to therapy and vaccines. Three hours of lecture. *Prerequisite: BIMM 100.* (S)

BIMM 134. Biology of Cancer (4)
This course covers basic processes of transformation and tumor formation in a two-part format. The first section is focused on molecular and cellular mechanisms of carcinogenesis. The second section discusses tumor pathology and metastasis. Open to upper-division students only. *Prerequisites: BICD 110 and BIMM 100.*

BIMM 140. Introduction to Bioinformatics (4)
Introduction to basic methods used in bioinformatics and computational biology. Survey of methods used in computational analysis of DNA such as sequence assembly, sequence comparison, gene modeling, and sequence databases. Survey methods used in the computational analysis of protein sequences such as alignments, motif and pattern recognition, family classification, and protein structure prediction. Survey of organismic database methods. Emphasis is on a broad survey of current approaches with an introduction to statistical and computational techniques for analyzing, comparing, and validating methods. *Prerequisites: BIBC 100 or 102, BIMM 100, and BICD 100. (BIMM 100 may be taken concurrently.)*

BIMM 141. Bioinformatics Laboratory (4)
Laboratory course giving hands-on exposure to topics covered in BIMM 140. Survey of methods used in computational analysis of DNA such as sequence assembly, sequence comparison, gene modeling, and sequence databases. Survey of methods used in the computational analysis of protein sequences such as alignments, motif and pattern recognition, family classification, and protein structure prediction. *Prerequisites: BIBC 100 or 102, BIMM 100, BICD 100, and BIMM 140.*

BIMM 142. Advanced Bioinformatics (4)
Continuation of BIMM 140 emphasizing advanced topics in bioinformatics and computational biology. Emphasis is on computational approaches at the level needed to design and implement new approaches. Topics: computational and statistical approaches to computational biology including probablistic models, machine learning approaches, and using federated resources to develop integrated approaches to bioinformatic problems. *Prerequisites: BIBC 100 or 102, BIMM 100, BICD 100, and BIMM 140.*

BIMM 150. Post-Genomics Biology (2)
This course will focus on large-scale analysis of post-genomics biological systems. Students will be introduced to methods for analyzing changes in gene expression, identifying protein-protein interactions, screening for pathway inhibitors, characterizing multi-protein complexes, and probing protein localization and function. *Prerequisite: consent of instructor.* (W)

BIMM 181. Molecular Sequence Analysis (4)
This course covers the analysis of nucleic acid and protein sequences, with an emphasis on the application of algorithms to biological problems. Topics include sequence alignments, database searching, comparative genomics, and phylogenetic and clustering analysis. Pairwise alignment, multiple alignment, DNA sequencing, scoring functions, fast database search, comparative genomics, clustering, phylogenetic trees, gene finding/DNA statistics. This course open to bioinformatics majors only. *Prerequisites: CSE 100 or Math. 176, CSE 101 or Math. 188, BIMM 100 or Chem. 114C.*

BIMM 182. Biological Databases (4)
This course provides an introduction to the features of biological data, how that data are organized efficiently in databases, and how existing data resources can be utilized to solve a variety of biological problems. Relational databases, object oriented databases, ontologies, data modeling and description, survey of current biological database with respect to above, implementation of database focused on a biological topic. This course open to bioinformatics majors only. *Prerequisite: CSE 100 or Math 176.*

BIMM 184. Computational Molecular Biology (4)
This advanced course covers the application of machine learning and modeling techniques to biological systems. Topics include gene structure, recognition of DNA and protein sequence patterns, classification, and protein structure prediction. Pattern discovery, hidden Markov models/support vector machines/neural network/profiles, protein structure prediction, functional characterization or proteins, functional genomics/proteomics, metabolic pathways/gene networks. This course open to bioinformatics majors only. *Prerequisite: BIMM 181 or BENG 181 or CSE 181, BIMM 182 or BENG 182 or CSE 182.*

BIMM 185. Bioinformatics Laboratory (Advanced) (4)
This course emphasizes the hands-on application of bioinformatics methods to biological problems. Students will gain experience in the application of existing software, as well as in combining approaches to answer specific biological questions. Sequence alignment, fast database search, profiles and motifs, comparative genomics, gene finding, phylogenetic trees, protein structure, functional characterization of proteins, expression anaylysis, computational proteomics. This course open to bioinformatics majors only. *Prerequisite: two courses out of: BIMM 181 or BENG 181 or CSE 181, BIMM 182 or BENG 182 or CSE 182, BENG 183, BIMM 184 or BENG 184 or CSE 184.*

Animal Physiology and Neuroscience

BIPN 100. Mammalian Physiology I (4)
This course introduces the concepts of physiological regulation, controlled and integrated by the nervous and endocrine systems. It then examines the muscular, cardiovascular, and renal systems in detail and considers their control through the interaction of nervous activity and hormones. Three hours of lecture and one hour of discussion. *Prerequisites: BILD 1; BILD 2.* (F,W,S)

BIPN 102. Mammalian Physiology II (4)
This course completes a survey of organ systems begun in BIPN 100 by considering the respiratory and gastrointestinal systems. Consideration is given to interactions of these systems in weight and temperature regulation, exercise physiology, stress, and pregnancy and reproduction. Three hours of lecture and one hour of section per week. *Prerequisite: BIBC 102; BIPN 100.* (F,W,S)

BIPN 105. Animal Physiology Lab (6)
Experiments are performed on membrane physiology; nerve muscle function; cardiovascular physiology; respiratory, gastrointestinal and renal physiology. Subjects include experimental animals and humans. *Prerequisite: BIPN 100 (may be taken concurrently).* Three hours of lecture and ten hours of laboratory each week. In addition to the formal lab hours, there will be at least eight hours in which students will be required to work in the class laboratory to complete experiments and prepare for presentations. Attendance at the first lecture/lab is required. Non-attendance will result in the student's being dropped from the course roster. It is the student's responsibility to officially drop the course. (F,W,S)

BIPN 106. Comparative Physiology (4)
This course examines the physiological adaptation of animals, invertebrates and vertebrates, to their particular environmental and behavioral niches. Structural, functional, and molecular adaptions of the basic organ systems are discussed. *Prerequisites: BILD 2, Chem. 6A-B-C or Chem. 7A-B-C. BILD 3 is recommended.* (W)

BIPN 108. Integrative Biology of Exercise (4)
Course will integrate the organ system biology learned in Mammalian Physiology I and II through the study of the human body's response to exercise. Specifically, the multi-organ system reaction to both acute and chronic exercise will be studied from the functional to the basic mechanistic level. Thus, the role

of exercise in both health and disease will be addressed. *Prerequisites: BIPN 100; BIPN 102.* (S)

BIPN 140. Cellular Neurobiology (4)
This course covers the biophysics of the resting and active membranes of nerve cells. It also covers the mechanisms of sensory transduction and neuromodulation, as well as the molecular basis of nerve cell function. *Prerequisites: BILD 1, 2; BIBC 100 or 102 recommended.* (F)

BIPN 142. Systems Neurobiology (4)
This course covers integrated networks of nerve cells, including simple circuits like those involved in spinal reflexes. We will study how information and motor output is integrated and processed in the brain. We will also discuss higher-level neural processing. *Prerequisites: BILD 1, 2, and BIBC 100 or 102.* (W)

BIPN 144. Developmental Neurobiology (4)
Cellular and molecular basis of cell determination, neurite outgrowth, specificity, synaptogenesis, and cell death in the brain. *Prerequisites: BILD 1, 2, and BIBC 100 or 102, BICD 100, BIPN 142 recommended.* (S)

BIPN 145. Neurobiology Laboratory (4)
Basic principles of nerve and muscle physiology will be taught through weekly exercises and individual projects. One hour of lecture and nine hours of laboratory each week. *Prerequisite: BIPN 140 or BIPN 142 or BIPN 146 (may be taken concurrently).* (F)

BIPN 146. Computational Neurobiology (4)
An exploration of computational brain models, including biophysical models of single neurons, small neural circuits, and larger scale network models. *Prerequisite: BILD 12 or BIPN 140 or Psych. 106 or Cog. Sci. 107 recommended.* (S)

BIPN 148. Cellular Basis of Learning and Memory (4)
Cellular and molecular mechanisms that underlie learning and memory. Synapse formation and synaptic plasticity, neurotransmitter systems and their receptors, mechanisms of synaptic modification, and effect of experience on neuronal connectivity, and gene expression. *Prerequisites: BILD 1; BILD 2; BIBC 100 (may be taken concurrently).* (W)

Special Courses

BISP 190. Advanced Biology Seminars for Seniors (2)
Experts in diverse areas of biology from major universities in the U.S. and abroad will describe current research activities being conducted in their laboratories. Relevant readings will be assigned. P/NP grades only. *Prerequisites: seniors only; concurrent enrollment in BISP 199 or consent of instructor.* (F,W,S)

BISP 195. Introduction to Teaching in Biology (4)
Introduction to the teaching of the basic course in biology. A student under the direction of the instructor of the course is assigned one class section and will meet one time per week with the section. A student is required to attend the course lecture and meet with the instructor of the course at least one time per week. Limited to upper-division students who have a B average or higher. Three hours' lecture. (P/NP grades only.) *Prerequisites: consent of instructor and approval of department chair.* (**Note**: Applications for a BISP 195 are to be submitted to the Division of Biological Sciences by the end of the sixth week of the quarter preceding the quarter in which the BISP 195 will be completed.) (F,W,S) This course may be counted as one of the upper-division electives for a biology major. (F,W,S)

BISP 196. Honors Thesis in Biology (4)
Senior thesis research program. Research is conducted under the supervision of a biology faculty member. This one-year program is taken in addition to the major requirements for graduation. Upon satisfactory completion of the program, students will receive "Distinction in Biology" on their transcripts. *Prerequisites: senior standing, 3.7 GPA or above; prior selection for the program by a faculty member and approval by program coordinator. A department stamp will be used to monitor during registration.* (F,W,S)

BISP 197. Biology Internship Program (4)
Under the joint supervision of a biology faculty adviser and a selected industry mentor, the student will conduct independent research on a problem in an industrial biotech laboratory. The student will gain insight into industry research and practical biotech experience. *Prerequisites: BIBC 103 or BIMM 101, BIBC 102, BICD 100, BIMM 100, overall GPA 3.0, and consent of the biology faculty coordinator.* (W,S)

BISP 199. Independent Study for Undergraduates (4)
Independent reading or research on a problem by special arrangement with a faculty member. (P/NP grades only.) *Prerequisites: overall UCSD GPA of at least 3.0, minimum of ninety units, consent of instructor, and approval by division chair.* (Note: Applications for a BISP 199 must be submitted to, and approved by, the Division of Biological Sciences prior to the eighth week of the quarter preceding the quarter in which the BISP 199 will be completed.) (F,W,S) This course may be counted as one of the upper-division electives for a biology major, providing that no other special studies courses have already been counted toward the major.

GRADUATE

BGGN 204. Topics in Community and Population Ecology (3)
This course teaches a different topic each quarter on the theoretical or conceptual side of community and population ecology. Students will read materials in depth, attend weekly discussions, and explore theories and models with statistical, analytical, and algorithmic tools of the trade. *Prerequisite: graduate standing or consent of instructor.* (S/U grades only) (Quarter offered varies and course is not offered every year.)

BGGN 206. Topics in Biophysics and Physical Biochemistry (4)
Selection of topics of current interest. Examples: primary processes of photosynthesis; membrane biophysics; applications of physical methods to problems in biology and chemistry, e.g., magnetic resonance, X-ray diffraction, fluctuation spectroscopy, optical techniques (fluorescence, optical rotary dispersion, circular dichroism). Topics may vary from year to year. *Prerequisite: consent of instructor.* (S/U grades permitted.) This course is cross-listed with Physics 206 and Chemistry 206. (Quarter offered varies, and course is not offered every year.)

BGGN 212. Special Topics in Microbiology (3)
Recent developments in prokaryotic and eukaryotic microbial research. Topics vary from year to year but may include the following subjects: the molecular basis of (a) sex determination, expression, and interconversion; (b) differentiation, morphogenesis, and programmed death; (c) transcriptional and metabolic regulation; and (d) chemical macromolecular and energy-mediated reception, transmission, and response processes. The main thesis of the course is that examples of complex regulatory phenomena in higher organisms can be found in single celled organisms. This course is open to enrollment by undergraduates. *Prerequisites: BIBC 102 and BICD 100.* (S/U grades permitted.)

BGGN 213. Topics in Conservation Biology (3)
Provides in depth coverage of topics in population genetics and ecology, community ecology, biogeography, human ecology, and ecosystem management relevant to conservation biology. Topics vary from year to year and have included pedigree analysis, inbreeding depression, minimum viable population size, problems of overabundance, fragmented populations, keystone species, in-situ and ex-situ conservation techniques. One two-hour meeting weekly. *Prerequisite: graduate standing or consent of instructor.* (S/U/grades only.) (S)

BGGN 215. Phylogenetics (3)
This course provides the theoretical and practical basis of phylogenetic analysis (the estimation of phylogenetic trees). Students will understand the assumptions made in phylogenetic analysis, be able to identify the strengths and weaknesses of various methods, and perform a phylogenetic analysis on DNA sequence data. *Prerequisite: one semester of calculus is recommended.* (S)

BGGN 218. Post-Genomics Biology (2)
This course will focus on large-scale analysis of post-genomics biological systems. Students will be introduced to methods for analyzing changes in gene expression, identifying protein-protein interactions, screening for pathway inhibitors, characterizing multi-protein complexes, and probing protein localization and function.

BGGN 219. Classic Papers in Genetics (3)
The course explores, through classic papers, how genetic approaches in the distant and near past have opened up novel areas of biology. The goal of the course is to teach students the type of approach that allowed these researchers to break out of old paradigms and form new ones of their own based on genetic pathfinding. (W)

BGGN 220. Graduate Molecular Biology (6)
Provides a broad, advanced-level coverage of modern molecular biology for first-year graduate students. Topics include prokaryotic and eukaryotic gene structure and regulation, chromatin structure, DNA replication, translation, mechanisms of transcription, and an introduction to viruses. OPEN ONLY TO STUDENTS ENROLLED IN A GRADUATE DEGREE PROGRAM. (Letter grades only.) (F)

BGGN 221. Graduate Protein Biochemistry (4)
Topics include general aspects of protein structure and biochemical approaches to the isolation and study of proteins. This course also covers the relationship between the structure and function of selected proteins. Detailed discussion of modern biophysical methods to study protein-protein interactions will be included. *BGGN 220 is a co-requisite.* OPEN ONLY TO STUDENTS ENROLLED IN A GRADUATE DEGREE PROGRAM. (Letter grades only.) *Corequisite: BGGN 220.* (F)

BGGN 222. Graduate Cell Biology (6)
A coverage of modern cell biology for first year graduate students. There is an up-to-date discussion of topics such as: structure and function of membranes; ion pumps, ion channels, transmembrane signalling; receptor mediated endocytosis; protein targeting; the

role of RER and Golgi apparatus; the biosynthesis of intracellular organelles in animal and plant cells; the cytoskeleton, motility, molecular motors, cell-cell interactions, mitosis; and the control of cell division. Also included are extensive coverage of cell signalling mechanisms and discussions on molecular approaches to cell biology. *Prerequisites: BGGN 220 and 221.* OPEN ONLY TO STUDENTS ENROLLED IN A GRADUATE DEGREE PROGRAM. (Letter grades only.) (W)

BGGN 223. Graduate Genetics (6)
Provides a broad and extensive advanced-level coverage of molecular and formal aspects of genetics for first-year graduate students. Topics covered include: bacterial genetics, recombination in prokaryotes and eukaryotes, mammalian somatic-cell genetics, developmental genetics, sex determination, dosage compensation, and immunogenetics. Extensive coverage of the use of model systems like Drosophila and C. elegans is included. General and specific aspects of cellular signalling mechanisms will be covered. *Prerequisites: BGGN 220, 221 and 222.* OPEN ONLY TO STUDENTS ENROLLED IN A GRADUATE DEGREE PROGRAM. (Letter grades only.) (S)

BGGN 224. Graduate Neurobiology (4)
Course covers modern molecular, cellular, developmental, and physiological aspects of neurobiology. Extensive discussion of original research articles will be included. *Prerequisites: BGGN 220 and 221.* OPEN ONLY TO STUDENTS ENROLLED IN A GRADUATE DEGREE PROGRAM. (Letter grades only.) (F)

BGGN 225. Graduate Immunology (4)
The course is devoted to immunology and is organized as a combined lecture-tutorial course stressing classical as well as current literature. Each week will compose an independent section. Topics will include cellular interactions involved in the immune response and the molecular biology unique to lymphoid factor and receptors. *Prerequisites: BGGN 220 and 221.* OPEN ONLY TO STUDENTS ENROLLED IN A GRADUATE DEGREE PROGRAM. (Letter grades only.) (S)

BGGN 226. Graduate Animal Virology (4)
This course consists of a review of fundamental concepts together with an in-depth analysis of the structure, genetics, multiplication and oncogenicity of animal viruses. Particular emphasis will be given to the DNA and RNA tumor viruses. The format of this section includes lectures and discussion of selected papers. *Prerequisites: BGGN 220 and 221.* OPEN ONLY TO STUDENTS ENROLLED IN A GRADUATE DEGREE PROGRAM. (Letter grades only.) (W)

BGGN 227. Graduate Topics in Plant Biology (4)
This course covers advanced topics in plant biology in the areas of molecular genetic developmental, and physiological biology. We will discuss plant-microbe interactions, transposable elements, protein trafficking, ion transport, and organ development. The format of this section includes lectures and discussion of selected papers. *Prerequisites: BGGN 220, 221, and 222.* OPEN ONLY TO STUDENTS ENROLLED IN A GRADUATE DEGREE PROGRAM. (Letter grades only.) (W)

BGGN 228. Graduate Developmental Biology (4)
This course covers graduate level lectures on developmental biology, emphasizing the use of genetically tractable model systems. Discussion of recent research articles is an integral aspect of this course. Students are introduced to classical experiments and given detailed coverage of recent fundamental findings in developmental biology. *Prerequisites: BGGN 220 and 221.* (Letter grades only.) (S)

BGGN 229. Graduate Oncogenes (4)
This course provides detailed coverage of the cellular and molecular basis of cellular transformation and oncogenesis. There will be extensive discussion on the role of oncogenes and their cellular counterparts. The course also provides in-depth analysis of intracellular signal transduction mechanisms. *Prerequisites: BGGN 220, 221, and 222.* (Letter grades only.) (S)

BGGN 230. Graduate Signal Transduction (4)
The course will introduce students to a variety of signal transduction pathways and their function in the regulation of cellular processes. Special emphasis will be given to signaling cascades regulating immunological responses and alterations of signaling pathways during oncogenesis. (W)

BGGN 232. Human Retrovirology (3)
This course consists of both lectures and journal reviews on replication, genetic regulation and pathogenesis of HIV and TLV, and on recent developments of vaccine and therapy against AIDS. Open to upper-division students with consent of instructor. *Prerequisite: BIMM 100 or equivalent.* (S/U grades only) (S)

BGGN 233. Cellular Immunology (3)
This course covers the molecular and cellular events in the humoral and cellular response to antigen, transplantation biology, the structure and function of the major histocompatibility gene complex, the T-cell receptor, lymphokines, and the induction of immunological tolerance. It serves as the second course in a two-part sequence. May be taken by undergraduates who have taken Part 1 (BICD 140) and by graduate students (S/U grades only.) (Quarter offered varies and course is not offered every year.)

BGGN 235. Biology and Biochemistry of Cancer Cells (2)
This course covers recent advances in cell biology, biochemistry, immunology, and virology as they relate to cancer cells and their interaction with the host. Cancer research specialists from outside will be brought in to discuss the most recent evidence and interpretations in key areas of cancer research. This course meets two hours per week for lecture and discussion. It will be at an advanced graduate level but open to a limited number of seniors (with permission of instructor) on a P/NP basis. (S/U grades only) (Quarter offered varies, and course is not offered every year.)

BGGN 236. Essentials of Glycobiology (2)
Molecular glycobiology encompasses studies of the structure, biosynthesis, and biological roles of oligosaccharide units on glycoconjugates. This course provides an overview of this rapidly evolving field with an emphasis on the glycoconjugates of eukaryotic organisms in the animal kingdom. (S/U grades only.) (S) This course is cross-listed with Medicine 222.

BGGN 240. Cellular Neurobiology (2)
Students read classic and modern papers that form the basis of the undergraduate lectures (BIPN 240), which they are encouraged to attend. These papers are presented by the students at weekly discussion sessions. *Prerequisite: consent of instructor.* (S/U grades only.) (F)

BGGN 241. Neurobiology Seminar (3)
Presentation of current research by local and visiting neurobiologists. (S/U grades only.) (F,W,S)

BGGN 242. Systems Neurobiology (2)
Students read classic and modern papers that form the basis of the undergraduate lectures (BIPN 142), which they are encouraged to attend. These papers are presented by the students at weekly discussion sessions. *Prerequisite: consent of instructor.* (S/U grades only.) (W)

BGGN 243. Systems Neurophysiology (3)
Ways in which neurons are assembled into circuits to achieve perception and patterned movement. *Prerequisites: graduate standing or consent of instructor.* (S/U grades only.)

BGGN 244. Molecular/Developmental Neurobiology (2)
Students read classic and modern papers that form the basis of the undergraduate lectures (BIPN 144), which they are encouraged to attend. These papers are presented by the students at weekly discussion sessions. *Prerequisite: consent of instructor.* (S/U grades only.) (S)

BGGN 246 A-B. Computational Neurobiology (2-2)
Students read classic and modern papers that form the basis of the undergraduate lectures (BIPN 146), which they are encouraged to attend. Students present these papers at weekly discussion sessions. The focus of 246A is cellular neuronal properties and the focus of 246B is properties of neuronal systems. *Prerequisites: graduate student or consent of instructor.* (S/U grades only.)

BGGN 247. Development of Neural Systems (4)
Course emphasizes current molecular and physiological approaches used to study the development of neural circuits including the processes of neuronal migration, axon pathfinding, and synapse and circuit formation in different systems. Topics include development of the visual system, olfactory system, spinal cord and cerebellum. *Prerequisite: graduate standing or consent of instructor.* (S/U grades only.)

BGGN 248. Molecular Mechanisms of Neural Development (4)
The cellular and molecular basis of neural development, focusing on primary papers. Topics include: neural induction and neurogenesis, cell patterning, neuronal and glial differentiation, neuronal migration, axon pathfinding, synapogenesis, neuronal cell death, regeneration, activity-dependent events, topographic maps, invertebrate and vertebrate model systems. *Prerequisite: graduate standing or consent of instructor.*

BGGN 249A-B-C. Basic Neuroscience (4-4-4)
These courses are designed for graduate students in the neurosciences and other departments that are part of the interdisciplinary program (i.e., Biology, Cog. Sci.). These courses have been designed to cover as much basic neuroscience as possible in three quarters of study. They will combine two three-hour meetings each week with a 1.5 hour lecture and a 1.5 hour discussion of papers. These are required courses for all first-year neurosciences graduate students. *Prerequisite: graduate student or consent of instructor.* (F,W,S)

BGGN 251. Molecular Biology (3)
The first section of this course consists of a review of fundamental concepts in molecular biology together with an in-depth analysis of molecular biological topics of medical importance. The second section covers the structure, genetics, and multiplication of animal viruses, with particular emphasis on the DNA and RNA tumor viruses. Other subjects discussed include viral persistence, latency, and approaches to viral chemotherapy. Three hours of lecture. *Prerequisite: biochemistry.* (Not open to undergraduates.) (S/U grades only) (F)

BGGN 252. Genetics (3)
Human genetics, with emphasis on basic principles. Topics covered include chromosome abnormalities, the mechanisms of dominant and recessive diseases, pedigree analysis, ascertainment of linkage, the interaction of genotype with diseases. Mechanisms of maintaining genetic diversity in human populations will be discussed along with recent approaches to genetic counseling and intervention. *Prerequisite: consent of instructor.* (Not open to undergraduates.) (S/U grades only) (F)

BGGN 253. Immunology (3)
Graduate students will explore topics in specialized areas of immunochemistry and cellular immunology, antigenic and molecular structure of immunoglobulin molecules; antigenantibody interactions; cellular events in the humoral and cellular immune responses; translation immunology. *Prerequisite: consent of instructor.* The course is similar in content to BICD 140 but is accelerated in pace. (S/U grades permitted.) This course is cross-listed with Chemistry 217.(F)

BGGN 254. Cell and Membrane Physiology (3)
This course is a survey covering current subjects in membrane biology relevant to medicine. Subjects are: 1) membrane isolation, composition, and structure; 2) consequences of membrane fluidity (mode of action of anesthetics, intercellular communication, eso- and endo-cytosis biogenesis); 3) sensory perception and response (chemo- and energy reception, cellular neurophysiology, muscle; physiology); 4) regulation of membrane function (hormone reception, intercellular adhesion, neoplastic transformation). *Prerequisites: biochemistry and genetics.* (S/U grades only)

BGGN 260. Neurodynamics (4)
Introduction to the nonlinear dynamics of neurons and simple neural systems through nonlinear dynamics, bifurcation theory, and chaotic motions. The dynamics of single cells is considered at different levels of abstraction, e.g., biophysical and "reduced" models for analysis of regularly spiking and bursting cells, their dynamical properties, and their representation in phase space. Laboratory exercises will accompany the lectures. *Prerequisites: graduate student or consent of instructor.*

BGGN 266. Advanced Laboratory in Biophysical Techniques (6)
Experiments that emphasize biophysical principles through hands-on experience, with an emphasis on the blending of physical measurements with a clearly identified biological problem. Exercises include the use of optical tweezers to measure viscous forces at the level of cellular organelles, the characterization of sensorimotor control in the fly during visually guided flight, and the use of microscopic imaging techniques to characterize cell motility and organelle transport. Includes instruction in LabView. Students are encouraged to attend the Phys. 173 undergraduate lectures. *Prerequisites: graduate student or consent of instructor. Phys. 120A, BILD 1, and Chem. 6CL for undergraduates.*

BGGN 269. Mathematics for Neurobiologists (6)
An intensive course to introduce the mathematical concepts and techniques used in modern neurobiology. Intended for beginning graduate students in the neurosciences, but is also available to advanced undergraduates, with the consent of the instructor. *Prerequisites: graduate student or consent of instructor.*

BGGN 271. Advanced Experimental Methods in Biology (4-12)
Advanced laboratory and/or field experience in contemporary biological methodology. Open only to students enrolled in the integrated Bachelor's/Master's Degree Program. *Prerequisites: consent of instructor and approval of division chair.* (F,W,S) (Undergraduate students: P/NP only. Graduate students: letter grades only.)

BGGN 297. Research Conference (1-3)
Group and individual discussion of research activities and of current literature. *Prerequisite: graduate standing.* (S/U grades only.) (F,W,S)

BGGN 298. Laboratory Projects in Biology (3-12)
An introduction to contemporary laboratory techniques and research interests through independent, original projects under the direction of individual faculty members. *Prerequisite: consent of instructor.* (Letter grades only) (F,W,S)

BGGN 299. Thesis Research in Biology (1-12)
(F,W,S)

BGGN 500. Apprentice Teaching (4)
This course involves participation in upper-division undergraduate teaching at the level of assuming responsibility for recitation sections or laboratories under the supervision of the responsible faculty member. Some experience in lecturing to upper-division classes will occasionally be provided. (S/U grades only.) (F,W,S)

BGJC 201. Journal Club in Cell Biology (1)
Weekly presentations and discussions pertaining to research results reported in recently published literature. *Prerequisites: none for graduate students. Undergraduates must be seniors or enrolled in BISP 199.* (S/U grades only.) (F,W,S)

BGJC 202. Journal Club in Developmental Biology (1)
Weekly presentations and discussions pertaining to research results reported in recently published literature. *Prerequisites: none for graduate students. Undergraduates must be seniors or enrolled in BISP 199.* (S/U grades only.) (Quarter offered is varies, and course is not offered every year.)

BGJC 203. Journal Club in HIV Molecular Biology (1)
Weekly presentations and discussions pertaining to research results reported in recently published literature. *Prerequisites: none for graduate students. Undergraduates must be seniors or enrolled in BISP 199.* (S/U grades only.) (F,W,S)

BGJC 204. Journal Club in Molecular and Cellular Immunology (1)
Weekly presentations and discussions pertaining to research results reported in recently published literature. *Prerequisites: none for graduate students. Undergraduates must be seniors or enrolled in BISP 199.* (S/U grades only.) (F,W,S)

BGJC 205. Journal Club in Cellular Immunology (1)
Weekly presentations and discussions pertaining to research results reported in recently published literature. *Prerequisites: none for graduate students. Undergraduates must be seniors or enrolled in BISP 199.* (S/U grades only.) (F,W,S)

BGJC 206. Journal Club in Microbial Physiology (1)
Weekly presentations and discussions pertaining to research results reported in recently published literature. *Prerequisites: none for graduate students. Undergraduates must be seniors or enrolled in BISP 199.* (S/U grades only.) (S)

BGJC 207. Journal Club in Neurobiology (1)
Weekly presentations and discussions pertaining to research results reported in recently published literature. *Prerequisites: none for graduate students. Undergraduates must be seniors or enrolled in BISP 199.* (S/U grades only.) (F,W,S)

BGJC 208. Journal Club in Plant Molecular Biology (1)
Weekly presentations and discussions pertaining to research results reported in recently published literature. *Prerequisites: none for graduate students. Undergraduates must be seniors or enrolled in BISP 199.* (S/U grades only.) (F,W,S)

BGJC 209. Journal Club in Molecular and Cellular Regulation in Biology (1)
Weekly presentations and discussions pertaining to research results reported in recently published literature. *Prerequisites: none for graduate students. Undergraduates must be seniors or enrolled in BISP 199.* (S/U grades only.) (F,W,S)

BGJC 210. Journal Club in Cell Cycle Regulation (1)
Weekly presentations and discussions pertaining to research results reported in recently published literature. *Prerequisites: none for graduate students. Undergraduates must be seniors or enrolled in BISP 199.* (S/U grades only.) (F,W,S)

BGJC 211. Journal Club in Molecular Immunology (1)
Weekly presentations and discussions pertaining to research results reported in recently published literature. *Prerequisites: none for graduate students. Undergraduates must be seniors or enrolled in BISP 199.* (S/U grades only.) (F,W,S)

BGJC 212. Journal Club in Genetics (1)
Weekly presentations and discussions pertaining to research results reported in recently published literature. *Prerequisites: none for graduate students. Undergraduates must be seniors or enrolled in BISP 199.* (S/U grades only.) (F,W,S)

BGJC 213. Journal Club in Computational Neurobiology (1)
Weekly presentations and discussions pertaining to research results reported in recently published literature. *Prerequisites: none for graduate students. Undergraduates must be seniors or enrolled in BISP 199.* (S/U grades only.)

BGRD 202. Research Discussion in Early Amphibian Neurogenesis (1)
Presentations of new research results and discussions of closely related published reports. All students are expected to report on their own research findings each quarter. *Prerequisites: none for graduate students. Under-graduates must be seniors or enrolled in BISP 199.* (S/U grades only.)

BGRD 203. Research Discussion in Development of Dictyostelium (1)
Presentations of new research results and discussions of closely related published reports. All students are expected to report on their own research findings each quarter. *Prerequisites: none for graduate students. Under-graduates must be seniors or enrolled in BISP 199.* (S/U grades only.)

BGRD 204. Molecular Biology of the Cell (1)
Research reports and discussions based on recent experimental results in cell biology, oncogenesis, genetics, molecular biology and development. Students are expected to present and discuss their own new data and the recent data of others. *Prerequisites: none for graduate students. Undergraduates must be seniors or enrolled in BISP 199.* (S/U grades only.)

BGRD 205. Research Discussion in Plant Membrane Biology (1)
Presentations of new research results and discussions of closely related published reports. All students are expected to report on their own research findings each quarter. *Prerequisites: none for graduate students. Under-graduates must be seniors or enrolled in BISP 199.* (S/U grades only.)

BGRD 206. Research Discussion in Metals in Biology (1)
Presentations of new research results and discussions of closely related published reports. All students are expected to report on their own research findings each quarter. *Prerequisites: none for graduate students. Under-graduates must be seniors or enrolled in BISP 199.* (S/U grades only.)

BGRD 207. Research Discussion in Neuronal Pattern Generation (1)
Presentations of new research results and discussions of closely related published reports. All students are expected to report on their own research findings each quarter. *Prerequisites: none for graduate students. Under-graduates must be seniors or enrolled in BISP 199.* (S/U grades only.)

BGRD 208. Research Discussion in Mammalian Molecular Biology (1)
Presentations of new research results and discussions of closely related published reports. All students are expected to report on their own research findings each quarter. *Prerequisites: none for graduate students. Undergraduates must be seniors or enrolled in BISP 199.* (S/U grades only.)

BGRD 209. Research Discussion in AIDS (1)
Presentations of new research results and discussions of closely related published reports. All students are expected to report on their own research findings each quarter. *Prerequisites: none for graduate students. Under-graduates must be seniors or enrolled in BISP 199.* (S/U grades only.)

BGRD 210. Research Discussion in Virology (1)
Presentations of new research results and discussions of closely related published reports. All students are expected to report on their own research findings each quarter. *Prerequisites: none for graduate students. Under-graduates must be seniors or enrolled in BISP 199.* (S/U grades only.)

BGRD 211. Research Discussion in Developmental Cellular Neurobiology (1)
Presentations of new research results and discussions of closely related published reports. All students are expected to report on their own research findings each quarter. *Prerequisites: none for graduate students. Under-graduates must be seniors or enrolled in BISP 199.* (S/U grades only.)

BGRD 212. Research Discussion in Behavior and Development of Simple Nervous Systems (1)
Presentations of new research results and discussions of closely related published reports. All students are expected to report on their own research findings each quarter. *Prerequisites: none for graduate students. Under-graduates must be seniors or enrolled in BISP 199.* (S/U grades only.)

BGRD 213. Journal Club in Computational Neurobiology (1)
Weekly presentations and discussions pertaining to research results reported in recently published literature. *Prerequisites: none for graduate students. Under-graduates must be seniors or enrolled in BISP 199.*

BGRD 213. Research Discussion in Golgi Structure and Function (1)
Presentations of new research results and discussions of closely related published reports. All students are expected to report on their own research findings each quarter. *Prerequisites: none for graduate students. Undergraduates must be seniors or enrolled in BISP 199.* (S/U grades only.)

BGRD 214. Research Discussion in Development and Function of the Immune System (1)
Presentations of new research results and discussions of closely related published reports. All students are expected to report on their own research findings each quarter. *Prerequisites: none for graduate students. Undergraduates must be seniors or enrolled in BISP 199.* (S/U grades only.)

BGRD 215. Research Discussion in Lymphocyte Biology (1)
Presentations of new research results and discussions of closely related published reports. All students are expected to report on their own research findings each quarter. *Prerequisites: none for graduate students. Undergraduates must be seniors or enrolled in BISP 199.* (S/U grades only.)

BGRD 216. Research Discussion in Molecular and Cell Biology (1)
Presentations of new research results and discussions of closely related published reports. All students are expected to report on their own research findings each quarter. *Prerequisites: none for graduate students. Undergraduates must be seniors or enrolled in BISP 199.* (S/U grades only.)

BGRD 217. Research Discussion in Plant Membranes and Organelles (1)
Presentations of new research results and discussions of closely related published reports. All students are expected to report on their own research findings each quarter. *Prerequisites: none for graduate students. Undergraduates must be seniors or enrolled in BISP 199.* (S/U grades only.)

BGRD 218. Research Discussion in Plant Molecular Genetics (1)
Presentations of new research results and discussions of closely related published reports. All students are expected to report on their own research findings each quarter. *Prerequisites: none for graduate students. Undergraduates must be seniors or enrolled in BISP 199.* (S/U grades only.)

BGRD 219. Research Discussion in Molecular Biophysics (1)
Presentations of new research results and discussions of closely related published reports. All students are expected to report on their own research findings each quarter. *Prerequisites: none for graduate students. Undergraduates must be seniors or enrolled in BISP 199.* (S/U grades only.)

BGRD 220. Research Discussion in Advanced Evolutionary Biology (1)
Presentations of new research results and discussions of closely related published reports. All students are expected to report on their own research findings each quarter. *Prerequisites: none for graduate students. Undergraduates must be seniors or enrolled in BISP 199.* (S/U grades only.)

BGRD 221. Research Discussion in Behavioral Ecology (1)
Presentations of new research results and discussions of closely related published reports. All students are expected to report on their own research findings each quarter. *Prerequisites: none for graduate students. Undergraduates must be seniors or enrolled in BISP 199.* (S/U grades only.)

BGRD 222. Research Discussion in Evolutionary Molecular Ecology (1)
Presentations of new research results and discussions of closely related published reports. All students are expected to report on their own research findings each quarter. *Prerequisites: none for graduate students. Undergraduates must be seniors or enrolled in BISP 199.* (S/U grades only.)

BGRD 223. Research Discussion in Ecology (1)
Presentations of new research results and discussions of closely related published reports. All students are expected to report on their own research findings each quarter. *Prerequisites: none for graduate students. Undergraduates must be seniors or enrolled in BISP 199.* (S/U grades only.)

BGRD 224. Research Discussion in Plant Population Biology (1)
Presentations of new research results and discussions of closely related published reports. All students are expected to report on their own research findings each quarter. *Prerequisites: none for graduate students. Undergraduates must be seniors or enrolled in BISP 199.* (S/U grades only.)

BGRD 225. Research Discussion in Genetic Variation (1)
Presentations of new research results and discussions of closely related published reports. All students are expected to report on their own research findings each quarter. *Prerequisites: none for graduate students. Undergraduates must be seniors or enrolled in BISP 199.* (S/U grades only.)

BGRD 226. Research Discussion in Conservation Genetics (1)
Presentations of new research results and discussions of closely related published reports. All students are expected to report on their own research findings each quarter. *Prerequisites: none for graduate students. Undergraduates must be seniors or enrolled in BISP 199.* (S/U grades only.)

BGRD 227. Research Discussion in Intracellular Signalling (1)
Presentations of new research results and discussions of closely related published reports. All students are expected to report on their own research findings each quarter. *Prerequisites: none for graduate students. Undergraduates must be seniors or enrolled in BISP 199.* (S/U grades only.)

BGRD 228. Research Discussion in Drosophila Developmental Biology (1)
Presentations of new research results and discussions of closely related published reports. All students are expected to report on their own research findings

each quarter. *Prerequisites: none for graduate students. Undergraduates must be seniors or enrolled in BISP 199.* (S/U grades only.)

BGRD 229. Research Discussion in Drosophila Neurobiology (1)
Presentations of new research results and discussions of closely related published reports. All students are expected to report on their own research findings each quarter. *Prerequisites: none for graduate students. Undergraduates must be seniors or enrolled in BISP 199.* (S/U grades only.)

BGRD 230. Research Discussion in Cell Signalling Pathways (1)
Presentations of new research results and discussions of closely related published reports. All students are expected to report on their own research findings each quarter. *Prerequisites: none for graduate students. Undergraduates must be seniors or enrolled in BISP 199.* (S/U grades only.)

BGRD 231. Research Discussion in Nuclear Transport and Function (1)
Presentations of new research results and discussions of closely related published reports. All students are expected to report on their own research findings each quarter. *Prerequisites: none for graduate students. Undergraduates must be seniors or enrolled in BISP 199.* (S/U grades only.)

BGRD 232. Research Discussion in Chromatin and Transcription Regulation (1)
Presentations of new research results and discussions of closely related published reports. All students are expected to report on their own research findings each quarter. *Prerequisites: none for graduate students. Undergraduates must be seniors or enrolled in BISP 199.* (S/U grades only.)

BGRD 233. Research Discussion in Cell Cycle Motility (1)
Presentations of new research results and discussions of closely related published reports. All students are expected to report on their own research findings each quarter. *Prerequisites: none for graduate students. Undergraduates must be seniors or enrolled in BISP 199.* (S/U grades only.)

BGRD 234. Research Discussion in Cell Signalling in Drosophila (3)
Presentation of new research results and discussions of closely related published reports. All students are expected to report on their own research findings each quarter. *Prerequisites: none for graduate students. Undergraduates must be seniors or enrolled in BISP 199.* (S/U grades only.)

BGSE 200. Seminar in Biology (1)
Invited speakers from the U.S. and abroad, who are leaders in various aspects of biological research, describe their current research. *Prerequisites: none for graduate students. Undergraduates must be seniors or enrolled in BISP 199.* (S/U grades only.) (F,W,S)

BGSE 201. Seminar in Molecular Biology (1)
Invited speakers from the U.S. and abroad, who are leaders in various aspects of biological research, describe their current research. *Prerequisites: none for graduate students. Undergraduates must be seniors or enrolled in BISP 199.* (S/U grades only.) (F,W,S)

BGSE 202. Seminar in Immunology (1)
Invited speakers from the U.S. and abroad, who are leaders in various aspects of biological research, describe their current research. *Prerequisites: none for graduate students. Undergraduates must be seniors or enrolled in BISP 199.* (S/U grades only.) (F,W,S)

BGSE 203. Seminar in Population Biology (1)
Invited speakers from the U.S. and abroad, who are leaders in various aspects of biological research, describe their current research. *Prerequisites: none for graduate students. Undergraduates must be seniors or enrolled in BISP 199.* (S/U grades only.)

BGSE 204. Seminar in Developmental Genetics (1)
Invited speakers from the U.S. and abroad, who are leaders in various aspects of biological research, describe their current research. *Prerequisites: none for graduate students. Undergraduates must be seniors or enrolled in BISP 199.* (S/U grades only.) (F,W,S)

BGSE 205. Graduate Research Seminar (1)
Discussions of recent research in various aspects of biological research conducted by third- and fourth-year doctoral students in the Division of Biological Sciences. (S/U grades only.) (F,W,S)

Biomedical Sciences

OFFICE: 5008 Basic Science Building, School of Medicine
http://biomedsci.ucsd.edu

Professors

Kim E. Barrett, Ph.D., *Medicine*
Timothy D. Bigby, M.D., *Clinical Medicine*
Roland C. Blantz, M.D., *Medicine*
Gerry R. Boss, M.D., *Medicine*
Philip Bourne, Ph.D., *Pharmacology*
Joan Heller Brown, Ph.D., *Pharmacology (Interim Chair)*
Laurence L. Brunton, Ph.D., *Pharmacology/ Medicine*
Dennis A. Carson, M.D., *Medicine*
Webster K. Cavenee, Ph.D., *Medicine*
Kenneth R. Chien, M.D., Ph.D., *Medicine*
Shu Chien, M.D., Ph.D., *Bioengineering/Medicine*
Mario Chojkier, M.D., *Medicine*
Jerold J. M. Chun, Ph.D., *Pharmacology (Adjunct)*
Don W. Cleveland, Ph.D., *Medicine*
James W. Covell, M.D., *Medicine (Emeritus)*
Edward Dennis, Ph.D., *Pharmacology/Chemistry and Biochemistry*
Wolfgang H. Dillmann, M.D., *Medicine*
Jack E. Dixon, Ph.D., *Pharmacology/Cellular and Molecular Medicine/Chemistry and Biochemistry (Dean, Scientific Affairs)*
Daniel Donoghue, Ph.D., *Chemistry and Biochemistry*
Mark H. Ellisman, Ph.D., *Neurosciences*
Scott D. Emr, Ph.D., *Cellular and Molecular Medicine*
Gregory F. Erickson, Ph.D., *Reproductive Medicine*
Jeffrey Esko, Ph.D., *Cellular and Molecular Medicine*
Ronald M. Evans, Ph.D., *Biology (Adjunct)*
Marilyn G. Farquhar, Ph.D., *Cellular and Molecular Medicine (Chair)*
James R. Feramisco, Ph.D., *Medicine/ Pharmacology*
Theodore Friedmann, M.D., *Pediatrics*
Xiang-Dong Fu, Ph.D., *Cellular and Molecular Medicine*
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Christopher K. Glass, M.D., Ph.D., *Cellular and Molecular Medicine/Medicine*
Lawrence S. B. Goldstein, Ph.D., *Cellular and Molecular Medicine*
Philip M. Groves, Ph.D., *Psychiatry/ Neurosciences*
Michael C. Hogan, Ph.D., *Medicine (Adjunct)*
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Martin F. Kagnoff, M.D., *Medicine*
Michael Karin, Ph.D., *Pharmacology*
Kenneth Kaushansky, M.D., *Medicine (Chair)*
Carolyn J. Kelly, M.D., *Medicine (In-Residence)*
John Kelsoe, M.D., *Psychiatry*
Thomas J. Kipps, M.D., Ph.D., *Medicine*
Richard Kolodner, Ph.D., *Medicine*
Elizabeth A. Komives, Ph.D., *Chemistry and Biochemistry*
Ronald Kuczenski, Ph.D., *Psychiatry (In-Residence)*
Hyam L. Leffert, M.D., *Pharmacology*
Richard Lieber, Ph.D., *Orthopaedics*
Jamey D. Marth, Ph.D., *Cellular and Molecular Medicine*
James Andrew McCammon, Ph.D., *Chemistry and Biochemistry/Pharmacology*
Odile Mathieu-Costello, Ph.D., *Medicine (In-Residence)*
Pamela L. Mellon, Ph.D., *Reproductive Medicine/ Neurosciences*
Marc Montminy, M.D., Ph.D., *Biological Sciences (Adjunct)*
Alexandra Newton, Ph.D., *Pharmacology*
Sanjay Nigam, M.D., *Medicine/Pediatrics*
Daniel T. O'Connor, M.D., *Medicine (In-Residence)*
Jerrold M. Olefsky, M.D., *Medicine*
Renate B. Pilz, M.D., *Medicine (In-Residence)*
Frank L. Powell Jr., Ph.D., *Medicine*
Morton P. Printz, Ph.D., *Pharmacology*
Eyal Raz, M.D., *Medicine (Adjunct)*
Douglas D. Richman, M.D., *Pathology/Medicine (In-Residence)*

Michael G. Rosenfeld, M.D., *Medicine*
Geert Schmid-Schoenbein, Ph.D., *Bioengineering*
David S. Segal, Ph.D., *Psychiatry*
Shunichi Shimasaki, Ph.D., *Reproductive Medicine*
Grégg J. Silverman, M.D., *Medicine (In-Residence)*
Stephen A. Spector, M.D., *Pediatrics*
Charles F. Stevens, Ph.D., *Pharmacology (Adjunct)*
Palmer W. Taylor, Ph.D., *Pharmacy and Pharmaceutical Sciences (Dean)*
Susan S. Taylor, Ph.D., *Chemistry and Biochemistry*
Lynn F. TenEyck, Ph.D., *Pharmacology (Adjunct)*
Roger Y. Tsien, Ph.D., *Pharmacology/ Chemistry and Biochemistry*
Robert H. Tukey, Ph.D., *Pharmacology / Chemistry and Biochemistry*
Wylie W. Vale, Ph.D., *Medicine (Adjunct)*
Ajit P. Varki, M.D., *Medicine*
Peter D. Wagner, M.D., *Medicine*
John B. West, M.D., Ph.D., *Medicine*
David S. Williams, Ph.D., *Pharmacology/ Neurosciences (Adjunct)*
Joseph L. Witzum, M.D., *Medicine*
Anthony Wynshaw-Boris, M.D., Ph.D., *Pediatrics/ Medicine*
Tony L. Yaksh, Ph.D., *Anesthesiology/ Pharmacology*
Jason X. Yuan, M.D., Ph.D., *Medicine*
Maurizio Zanetti, M.D., *Medicine (In-Residence)*

Associate Professors

Joseph A. Adams, Ph.D., *Pharmacology*
John M. Carethers, M.D., *Medicine (In-Residence)*
Nazneen Dewji, Ph.D., *Medicine (Adjunct)*
Steven F. Dowdy, M.D., *Cellular and Molecular Medicine*
Richard Gallo, M.D., Ph.D., *Medicine (In-Residence)*
Michael Gribskov, Ph.D., *Biology (Adjunct)*
John C. Guatelli, M.D. *Medicine*
Fred Levine, M.D., Ph.D., *Pediatrics (In-Residence)*
Victor Nizet, M.D., *Pediatrics*
Oswald Quehenberger, Ph.D., *Medicine (Adjunct)*
Judith A. Varner, Ph.D., *Medicine (Adjunct)*
Francisco Villarreal, M.D., Ph.D., *Medicine (Adjunct)*
Nicholas J.G. Webster, Ph.D., *Medicine (In-Residence)*
Virgil L. Woods, Jr., M.D., *Medicine*
Anthony Wynshaw-Boris, M.D., Ph.D., *Pediatrics/ Medicine*
Jason X. Yuan, M.D., Ph.D., *Medicine*

Assistant Professors

Ju Chen, Ph.D., *Medicine*
Arshad Desai, Ph.D., *Cellular and Molecular Medicine*
Joseph G. Gleeson, M.D., *Neurosciences*
Bruce Hamilton, Ph.D., *Medicine*
Steffan Ho, M.D., Ph.D., *Pathology*
Mark A. Lawson, Ph.D., *Reproductive Medicine (In-Residence)*
Paul T. Martin, Ph.D., *Neurosciences*
Karen Oegema, Ph.D., *Cellular and Molecular Medicine*
Bing Ren, Ph.D., *Cellular and Molecular Medicine*
Peter Van der Geer, Ph.D., *Chemistry and Biochemistry*
Huilin Zhou, Ph.D., *Chemistry and Biochemistry*

The Graduate Program

The graduate program offered by the Group in Biomedical Sciences is designed to lead to the Ph.D. degree through a combination of didactic study, laboratory rotations, and thesis research in basic biomedical sciences. Research experiences are wide and varied, permitting students the options of selecting molecular, cellular, or organ and integrated systems approaches in their research programs. Students are encouraged to design and execute investigation in a self-critical and independent manner. Undergraduate preparation must include courses in mathematics (through calculus), chemistry (including organic, physical, and biochemistry), and if possible, participation in undergraduate research. Students whose undergraduate backgrounds are significantly different will be considered provided there is sufficient evidence of interest in cell and molecular biology, physiology, pharmacology, or eukaryotic regulatory biology, and a desire to enter a field of active research and academic excellence.

Doctoral Degree Program

During the first year, the students take basic courses in cell biology, molecular biology, pharmacology, and physiology. In a required laboratory rotation program, students develop laboratory skills and the ability to formulate scientific hypotheses and become familiar with the research activities of the faculty. Required advanced courses and electives in subsequent years are chosen to develop the students' interest and specialized knowledge in the thesis research area. The thesis laboratory is usually selected by the end of the first year of graduate study.

The graduate program is interdepartmental and interdisciplinary; it involves faculty of the Departments of Medicine, Pharmacology, Neurosciences, Reproductive Medicine, Chemistry, Pathology, Bioengineering, Cellular and Molecular Medicine, Psychiatry, Orthopedics, Anesthesiology, and the Cancer Center. Physiological studies include molecular to whole animal approaches to cardiovascular, microcirculatory, respiratory, renal, gastrointestinal and fetal physiology and their neural and hormonal control. Pharmacologic studies of drug action at the molecular and biochemical levels include studies of receptor structure and function, genetic and recombinant DNA methods to analyze ligand-receptor interactions, regulation of gene expression and signal transduction, and biophysical approaches to defining neurotransmitter and hormone action. Molecular and cell biological approaches are being applied to the study of major issues in cell biology, including the regulation of protein targeting and intracellular membrane traffic, hormone and growth factor receptors, endothelial cell biology, molecular motors, RNA splicing, and mitosis, among others. Eukaryotic regulatory biologists are using the most advanced molecular biological techniques to study developmental and homeostatic regulation of gene expression in primarily mammalian systems. As evidence of the research strength of the group, faculty within the program are the directors of four specialized centers of research at the university focusing on cancer, myocardial ischemia, hypertension, and atherosclerosis. Other faculty are directors of training grants for programs in pulmonary physiology, oncogenes, cardiovascular physiology, cellular and molecular pharmacology, hypertension, metabolic diseases, cell and molecular biology, genetics, digestive diseases, and cancer cell biology.

The graduate program in biomedical sciences is also designed to educate physician-scientists through the School of Medicine's Medical Scientist Training Program. Students already admitted to the School of Medicine are eligible for admission to our program for Ph.D. training. Such students generally apply in the first or second year of their medical studies and enter graduate studies following completion of their second year of medical school. Normative time for M.D./Ph.D. students is seven years.

Examinations

Students obtain letter grades in the program's basic courses. Candidacy for the Ph.D. degree is determined by a two-part examination. The first

part, the minor proposition examination, tests the student's competence and ability to design the approach to a pertinent research problem in an area unrelated to his or her major interest. The second part, the major proposition examination, deals with the dissertation problem and should be completed during the third year of residence in the program. After the preparation of the dissertation, an oral defense of the thesis completes the requirement for the Ph.D. degree.

COURSES

202. Carcinogenesis and Drug Metabolism (3)
This elective will explore relationships between drug metabolism and carcinogenesis at cellular, molecular and etiological levels. Guided by faculty, students will research and present key papers and principles underlying the biochemistry, genetics, biophysics, and computer-assisted aspects of several assigned topics. *Prerequisites: biology and chemistry. Cell biology, biochemistry, and molecular biology may be taken concurrently*

204. Evolution of Modern Concepts in Pharmacology (2)
This course details the evolution of modern principles of pharmacology from first evidences to the present level of knowledge. The course will be independent of but compliment general principles of pharmacology courses for medical and graduate students. *Prerequisites: prior or concurrent Principles of Pharmacology, or equivalent course.*

207. Using Internet Resources in Molecular Biology (2)
Increasing the Internet is a source both of data and analysis tools in molecular biology. A hands-on series of instructional lectures is proposed that uses these resources to work through problems found in many molecular biology research situations. Topics include: DNA and protein sequence analysis, genome analysis, constructing and using phylogenetic trees, RNA structure prediction, protein structure analysis, classification and prediction. *Prerequisites: consent of instructor.*

219. Ethics in Scientific Research (1)
Overview of ethical issues in scientific research, conflicts of interest; national, statewide and campus issues and requirement; ethical issues in publications; authorship; retention of research records; tracing of research records; attribution; plagiarism; copyright considerations; primary, archival and meeting summary publications; ethical procedures and policies; NIH, NSF, California and UCSD; case studies and precedents in ethics. *Prerequisites: permission of instructor.*

222. Essentials of Glycobiology (2)
Advanced elective for graduate/medical students who have had core courses in cell biology or biochemistry. Expert faculty will present a coordinated overview of the field of glycobiology, which explores the structure, synthesis and functions of sugar chains in biological systems.

223. Genetics, Metabolism, and Inherited Disease (2)
Detailed discussions of the molecular aspects of certain inborn errors of intermediary metabolism selected to illustrate principles of biochemical genetics applicable to a wider variety of clinically important genetic diseases. Individual sessions will include faculty presentations followed by student-led discussions of the particular principles illustrated by the disorders reviewed. (S)

224. Topics in Cancer Research (2)
Each quarter will focus on an important area of cancer research such as immunology (fall), growth regulation (winter), and cancer genetics (spring). One-hour lecture coordinated with a one-hour seminar with the opportunity to meet with the invited speaker. *Prerequisites: senior undergraduates, graduate students, medical students.* (W,S)

229. Methods in Pharmacology (3)
A combination of lecture and lab exercises presented by the faculty of the Group in Biomedical Sciences, designed to introduce biomedical science graduate students to the essential techniques employed in molecular and cellular pharmacology. *Prerequisites: BMS 212, OP, CBB, biochemistry, molecular biology, biomedical sciences or consent of instructor.* (S)

230. Receptors and Signal Transduction (3)
An examination of the molecular and biochemical bases of drug and neurotransmitter action. Topics include molecular basis of drug specificity, receptor mechanisms, neuropharmacology, signal transduction from the cell surface to the nucleus, and drug action on excitable tissues. *Prerequisite: course in biochemistry.* (F)

231. Contemporary Topics in Pharmacology (2)
A selection of short courses in the biomedical and pharmacological sciences offered by resident experts. Topics will vary annually. Each short course will last one to two weeks, meeting five hours a week. *Prerequisite: consent of instructor.* (F,W,S) (Not offered in fall 1997.)

232. In vivo Cellular and Molecular Imaging (1)
Strategies such as positron emission tomography, magnetic resonance imaging, and ultrasound for non-destructively imaging molecular and cell biological events inside living animals and eventually human patients. Emphasis on detecting angiogenesis, apoptosis, and expression of tumor-specific genes. *Prerequisites: upper-division or graduate courses in molecular and cell biology.*

233. Molecular Biology of Human Retroviruses (3)
Replication cycle and gene regulation of HIV. Molecular approaches to therapy and vaccines. *Prerequisites: undergraduates lower-division courses in BIMM 100.*

234. Practical Histopathology and Mouse Models of Human Diseases (2)
The course is designed to introduce or reintroduce histology and histopathology of the various organ systems to those who need to analyze mouse tissues as an essential part of their research. *Prerequisites: standard undergraduate biology courses.*

235. Pharmacogenomics (3)
The pharmacogenetics course is designed to introduce graduate students, medical students, and pharmacy students to this emerging area of interest, indicting how hereditary mechanisms influence drug responses in humans. The lectures, examples, discussions, and journal presentations will provide the students with a working knowledge of the domains of pharmacology, how heredity influences any response traits, and the ways that advances in genome technologies support our emerging understanding of how polymorphic genetic variants determine inter-individual differences in drug responses. The course will include lectures, discussions, and journal article presentations by students. *Prerequisites: Admission to a UCSD graduate program, School of Medicine, or School of Pharmacy and Pharmaceutical Sciences.*

240. Critical Reading in Cell Biology (3)
This course will focus on critical reading and understanding current areas in Cell and Molecular Biology. The exact topic will vary, but will include such topics as Protein Trafficking, Cell Division, Intracellular Movement, Cell Interaction, and Cell Cycle.

242. Seminar in Genetics (1)
Intended for graduate students interested in principles of classical and molecular genetics. Will attend weekly genetics seminar and participate in didactic/discussion preparatory session. *Prerequisite: consent of instructor.*

243. Human Genetics (3)
Advanced aspects of human genetics and human genetics disease, including principles of Mendelian and non-Mendelian inheritance, monogenic and polygenic traits, anticipation, penetrance, and genomics. Course will consist of alternating didactic sessions and seminars in which students will present papers.

245. Cancer Genetics (3)
Intended for graduate students interested in genetics. Course will cover genetic basis for cancer related diseases. *Prerequisites: graduate-level course in cell biology and molecular biology.*

250. Molecular and Modern Methodologies in Physiological Sciences (2)
This course emphasizes modern approaches and methodologies for investigating physiological processes in normal and pathological conditions. This includes the application of transgenic, knockout, adenovirus gene therapy, antisense, and cellular imaging technologies in animal models.

260. Immune Regulation (3)
This course will cover most of today's key aspects in the organization and dynamics of the immune system and its regulation. It will provide students with a basis for understanding the physiology and functioning of the immune system in normal and pathological states. *Prerequisites: core courses in Biomedical Sciences Ph.D. Program, or permission of instructor.*

262. Neurophysiology (4)
An overview of neurophysiological systems, emphasizing mammalian neurophysiology and related model vertebrate systems and concepts. (W)

264. Molecular and Cellular Basis of Disease (2)
Lectures on the molecular and cellular mechanisms of pathogenesis. Topics will include Alzheimer's disease, cell surface and unclear receptors in disease, signal transduction by oncogenes in cancer cells, AIDS, human diseases affecting glycosylation pathways, rheumatoid arthritis, and arteriosclerosis. *Prerequisite: graduate students.* (W)

282. Microbial Pathogenesis (3)
Topics covered in this course include molecular and cellular mechanisms of viral, bacterial, and protozoan pathogenesis. Host response and microbial mechanisms of evasion of host defense will also be discussed. Sessions will consist of faculty and student presentations of current literature. Prerequisite: graduate standing or consent of instructor. (S)

285. Statistical Inference in the Medical Sciences (2)
An introduction to basic techniques used in biomedical literature: t tests, ANOVA, chi-square, linear and nonlinear regression. Emphasis will be on understanding the appropriate use and interpretation of the tests, rather than on the calculations.

294. Pharmacology and Molecular Biology Journal Club (0-1)
Current literature in molecular pharmacology and molecular biology is reviewed. Two papers are chosen per week for oral presentation by students. Faculty critique the student presentations. *Prerequisite: enrollment in Ph.D. program at year two and above.* (F,W,S)

295. Pharmacology Research Discussions (0-1)
Student, faculty, and fellow discussion groups on research projects. Students are expected to present research findings to fellows, other Ph.D. students, and faculty. Written critiques are provided by the faculty. *Prerequisites: completion of minor proposition examination and two years of graduate work.* (F,W,S)

296. Directed Reading (1-4)
Reading of special topics under the direction of a faculty member. Exact subject matter to be arranged in individual cases. *Prerequisite: consent of instructor.*

297. Progress in Signal Transduction (1)
Papers describing recent progress in signal transduction from the cell-surface to the nucleus will be chosen from recent research literature. Two papers will be discussed and criticized in detail each week for one hour. *Prerequisites: graduate level Biochemistry, Cell Biology, and Molecular Biology; registered as second year and above graduate student in Biomedical Sciences, Biology, or Chemistry.* (F,W,S)

298. Directed Study (1-12)
Reading and laboratory study of special topics under the direction of a faculty member. Exact subject matter to be arranged in individual cases. (F,W,S)

299. Independent Study or Research (1-12)
Independent study or research. *Prerequisite: consent of instructor.* (F,W,S)

Biophysics

See "Physics" for more information.

OFFICES:

General Administration–
1110-113 Urey Hall Addition

Graduate Student Affairs–
1110-121 Urey Hall Addition

Undergraduate Student Affairs–
1110-115 Urey Hall Addition

Chair's Office–1110-113 Urey Hall Addition

Web site: http://physics.ucsd.edu/

The Department of Physics offers an undergraduate and graduate program which prepares students for a career in biophysics and which leads to the following degrees:

B.S. in physics with specialization in biophysics

C.Phil. in physics

Ph.D. in physics (biophysics)

A grade-point average of 2.0 or higher in the upper-division major program is required for graduation. All courses (lower- and upper-division) required for the major must be taken for a letter grade. Students must receive a grade of C- or better in any course to be counted toward fulfillment of the major requirements. In exceptional cases, students with a grade-point average in the major of 2.5 or greater may petition to have one grade of D accepted.

The Undergraduate Program

Physics Major with Specialization in Biophysics

This program leads to a bachelor of science degree. As a terminal degree, it is an excellent education for students who wish to work in the biotechnology industry, and provides an ideal background for students who plan to attend graduate or professional school in biological or biomedical fields.

This program is intended for students with a strong interest in bringing the concepts and technical advances from the physical sciences to bear on issues in biology. The curriculum is chosen to prepare students as rigorously trained but broad-minded generalists, so that they may attack problems in the biological, biochemical, and biomedical sciences with the tools and confidence that come from rigorous training in the physical sciences.

The curriculum for Physics Major with Specialization in Biophysics is designed to allow premedical students to complete all necessary courses for admission to medical schools.

The lower-division program for physics majors with specialization in biophysics includes basic courses in biology and chemistry as well as physics. Although the sequence Physics 4A through 4E is strongly recommended, students have the choice of petitioning the department to substitute the sequence Physics 2A through 2D.

The following courses are required for the physics major with specialization in biophysics:

Lower-Division

1. Physics 4A-B-C-D-E and 2CL-DL; or Physics 2A-B-C-D and 2CL-DL (Physics 4 sequence is strongly recommended)
2. Chemistry 6A-B-C and 6BL
3. Biology, BILD 1 and BILD 2
4. Mathematics 20A, 20B, 20C, 20D, 20E, 20F

The upper-division program includes advanced courses in physics, including two core lecture courses and one core laboratory course in biophysics, as well as organic chemistry.

Upper-Division

1. Physics 100A, 105A, 110A, 120A, 130A, 140A, 171, 172, 173
2. Chemistry 140A

Additional electives, to achieve a count of twelve upper-division courses in the major, may be selected from biology, chemistry, and physics. Three additional upper-division courses, in any subject, are required in order to satisfy UCSD requirements.

Premedical students will need to take two additional quarters of organic chemistry (Chemistry 140B and 140C), one quarter of organic chemistry laboratory (Chemistry 143A), and one quarter of an upper-division biology course. In addition, some medical schools also require a quarter of biochemistry (Biology BIBC 100 or Chemistry 114A). The premedical requirements may be used to satisfy elective requirements for upper-division courses.

As a guide to prospective students, we consider a schedule of required classes for a Muir College student.

Suggested Schedule

FALL	WINTER	SPRING
FRESHMAN YEAR		
Math. 20A	Chem. 6A	Chem. 6B
	Math. 20B	Chem. 6BL
	Phys. 4A	Math. 20C
		Phys. 4B
SOPHOMORE YEAR		
Chem. 6C	Math. 20E	Math. 20F
Math. 20D	Phys. 4D	Phys. 4E
Phys. 4C	Phys. 2CL	Phys. 2DL
JUNIOR YEAR		
Phys. 100A	BILD 1	BILD 2
Phys. 105A	Chem. 140A	Phys. 120A
Phys. 110A		Phys. 130A

SENIOR YEAR		
Phys. 140A	Phys. 172	Phys. 173
Phys. 171	Elec.	
	Elec.	

The Graduate Program

Research in biophysics is being actively pursued in several departments (e.g., physics, chemistry, and biology), which also offer courses in or relevant to biophysics.

Biophysics students will receive their M.S. and C.Phil. degrees in physics. Only their Ph.D. will be in physics (biophysics).

Doctoral Degree Program

The Ph.D. program consists of graduate courses, apprenticeship in research, teaching experience, and thesis research.

Entering students are assigned a faculty adviser to guide them in their program. Many students spend their first year as teaching assistants or fellows and begin apprentice research in their second year. When a student's association with a research area and research supervisor is well established, a faculty research progress committee is formed with the responsibility of conducting an annual review of progress and, at the appropriate time, initiating the formation of a doctoral committee. After three years of graduate study, or earlier, students complete the departmental examinations and begin thesis research. There is no foreign language requirement.

Entrance Testing

An entrance test covering undergraduate physics is given to entering students during the first week of orientation to give better guidance to students in their graduate program. The results are not entered in the student's file. Entering students are encouraged, but not obliged, to bring the results to the first meeting with their academic adviser. Entering students may elect to take the departmental examination instead of taking the entrance test.

Requirements for the Ph.D.

Students are required to pass a departmental examination, advanced graduate courses, a qualifying examination, teaching requirement, and a final defense of the thesis as described below.

1. Departmental Examination

Biophysics students are required to take a departmental examination after completing two years of graduate work at UCSD. The examination is on the level of material usually covered in upper-division courses and the graduate courses listed below:

Fall
Phys. 200A (Theoretical Mechanics)
Phys. 201 (Mathematical Physics)
Phys. 212A (Quantum Mechanics)

Winter
Phys. 200B (Theoretical Mechanics)
Phys. 203A (Adv. Classical Electrodynamics)
Phys. 212B (Quantum Mechanics)

Spring
Phys. 203B (Adv. Classical Electrodynamics)
Phys. 210A (Equilibrium Statistical Mechanics)
Phys. 212C (Quantum Mechanics)

The examination is offered twice a year, at the beginning of the fall and spring quarters, and lasts two days, four hours per day. The examination may be repeated once, the next time it is offered.

Biophysics students take the departmental examination after completing two years of graduate work.

2. Advanced Graduate Courses

Biophysics students are required to pass five courses (with a grade of C or better) from biology, biochemistry, chemistry, or physics in consultation with their adviser no later than the end of the third year of graduate work. At least three of these courses must be graduate courses. A 3.0 average in four of the five courses is required. (In lieu of the course requirement, students may petition to take an oral examination covering three areas of physics.)

3. Qualifying Examination and Advancement to Candidacy

In order to be advanced to candidacy, students must have met the departmental requirements and obtained a faculty research supervisor. At the time of application for advancement to candidacy, a doctoral committee responsible for the remainder of the student's graduate program is appointed by the Graduate Council. Members of the research progress committee are usually included as members of the doctoral committee. The committee conducts the Ph.D. qualifying examination during which students must demonstrate the ability to engage in thesis research. Usually this involves the presentation of a plan for the thesis research project. The committee may ask questions directly or indirectly related to the project and questions on general physics which it determines to be relevant. Upon successful completion of this examination, students are advanced to candidacy and are awarded the Candidate of Philosophy Degree.

4. Instruction in Physics Teaching

All graduate students are required to participate in the physics undergraduate teaching program as part of their career training. The main component of this requirement is an evaluated classroom-based teaching activity. All graduate student teaching accomplishments are subject to the approval of the vice chair for education. There are several ways of satisfying the teaching requirement, including: (1) leading discussions as a teaching assistant, (2) practical classroom teaching, under faculty supervision, (3) participation in an approved teaching development program offered by the Department of Physics or the campus Center for Teaching Development, or (4) transferred teaching credit from another institution or department. Students who satisfy the requirement by teaching at UCSD should enroll in Physics 500 during the quarter in which they complete it.

5. Thesis Defense

When students have completed their theses, they are asked to present and defend them before their doctoral committees.

Time Limits for Progress to the Ph.D.

In accordance with university policy, the Department of Physics has established the following time limits for progress to the Ph.D. A student's research progress committee helps ensure that these time limits are met.

	Theorists	Experimentalists
Advancement to Candidacy	4 years	5 years
Total Registered Time and Support	7 years	8 years

COURSES

Please refer to listings in the Departments of Biology, Chemistry and Biochemistry, and Physics.

Chemistry and Biochemistry

Chair's Office: 2040 Urey Hall Addition
(858) 534-3575
http://www-chem.ucsd.edu

Undergraduate Student Affairs
4010 York Hall
(858) 534-4856

Graduate Student Affairs
4010 York Hall
(858) 534-6870
Revelle College

Professors

William S. Allison, Ph.D., *Emeritus*
James R. Arnold, Ph.D., *Emeritus*
Timothy S. Baker, Ph.D.
Marjorie C. Caserio, Ph.D., *Emeritus*
Leigh B. Clark, Ph.D., *Emeritus*
Robert E. Continetti, Ph.D.
John E. Crowell, Ph.D.
Edward A. Dennis, Ph.D.
Jack E. Dixon, Ph.D.
Daniel J. Donoghue, Ph.D.
Russell F. Doolittle, Ph.D., *Research Professor*
Robert C. Fahey, Ph.D., *Research Professor*
Murray Goodman, Ph.D.
Elvin Harper, Ph.D., *Emeritus*
David N. Hendrickson, Ph.D.
Patricia A. Jennings, Ph.D.
David R. Kearns, Ph.D., *Emeritus*
Elizabeth A. Komives, Ph.D.
Joseph Kraut, Ph.D., *Emeritus*
Clifford P. Kubiak, Ph.D., *Chair*
Andrew C. Kummel, Ph.D.
Jack E. Kyte, Ph.D., *Emeritus*
Katja Lindenberg, Ph.D.
Douglas Magde, Ph.D.
Kurt Marti, Ph.D., *Emeritus*
J. Andrew McCammon, Ph.D.
Trevor C. McMorris, Ph.D., *Research Professor*
Stanley L. Miller, Ph.D., *Emeritus*
Mario J. Molina, Ph.D.
Xuong Nguyen-Huu, Ph.D., *Research Professor*
K.C. Nicolaou, Ph.D.
Joseph M. O'Connor, Ph.D.
Hans K. Oesterreicher, Ph.D.
Stanley J. Opella, Ph.D.
Charles L. Perrin, Ph.D., *Academic Senate Distinguished Teaching Award*
Kimberly A. Prather, Ph.D.
Michael J. Sailor, Ph.D.
Gerhard N. Schrauzer, Ph.D., *Emeritus*
Kurt E. Shuler, Ph.D., *Emeritus*
Susan S. Taylor, Ph.D.
Mark H. Thiemens, Ph.D., *Dean, Division of Physical Sciences*
Yitzhak Tor, Ph.D.
William C. Trogler, Ph.D.
Roger Y. Tsien, Ph.D.
Robert H. Tukey, Ph.D.
Joseph W. Watson, Ph.D., *Vice Chancellor, Student Affairs*
John H. Weare, Ph.D.
Ernest Wenkert, Ph.D., *Emeritus*
John C. Wheeler, Ph.D.
Peter G. Wolynes, Ph.D.
Bruno H. Zimm, Ph.D., *Emeritus*

Professor-in-Residence

Arnold L. Rheingold, Ph.D.

Senior Lecturer (SOE)

Barbara A. Sawrey, Ph.D., *Academic Senate Distinguished Teaching Award*

Associate Professors

F. Thomas Bond, Ph.D., *Provost, Revelle College, Emeritus*
Gourisankar Ghosh, Ph.D.
Partho Ghosh, Ph.D.
Amitabha Sinha, Ph.D
Emmanuel A. Theodorakis, Ph.D.

Assistant Professors

Michael D. Burkart, Ph.D.
Seth Cohen, Ph.D.
Alexander Hoffmann, Ph.D.
Simpson Joseph, Ph.D.
Yoshihisa Kobayashi, Ph.D.
Karsten Meyer, Ph.D.
Peter van der Geer, Ph.D.
Michael Van Nieuwenhze, Ph.D.
Wei Wang, Ph.D.
Jerry C. Yang, Ph.D.
Huilin Zhou, Ph.D.

Adjunct Professors

Kim K. Baldridge, Ph.D.
John E. Johnson, Ph.D.
Leslie E. Orgel, Ph.D.
Shankar Subramaniam, Ph.D.
John Wooley, Ph.D., *Associate Vice Chancellor for Research*

Associate Adjunct Professors

Seunghyon Choe, Ph.D.
Joseph P. Noel, Ph.D.

Introduction

The UCSD Department of Chemistry and Biochemistry was founded in the 1950s by the late Professor Harold Urey and a group of colleagues who strove to create a department that would stress the fundamentals of chemistry and, at the same time, embrace diverse applications of those principles at the frontiers of knowledge.

Degrees offered include:

Biochemistry

B.S. Biochemistry/Chemistry
M.S. Chemistry
Ph.D. Chemistry
Ph.D. Chemistry with specialization in bioinformatics

Chemistry

B.A. Environmental Chemistry
B.S. Biochemistry
B.S. Bioinformatics from the Department of Chemistry and Biochemistry
B.S. Chemical Education
B.S. Chemical Physics
B.S. Chemistry
B.S. Chemistry/Earth Sciences
B.S. Environmental Chemistry
B.S. Molecular Synthesis
B.S. Pharmacological Chemistry
M.S. Chemistry
Ph.D. Chemistry
Ph.D. Chemistry with specialization in bioinformatics

Chemistry–Premedical Majors

Either a biochemistry/chemistry major or a chemistry major with appropriate choice of electives provides a strong background for students intending to pursue careers in the medical sciences.

Premedical students are encouraged to complete the three-quarter general chemistry series (Chem. 6A-B-C or 6AH-6BH-6CH) in their first year. Most medical schools require both a full year of general chemistry, and may not accept Advanced Placement exam scores to satisfy admissions requirements. Students with Advanced Placement exam scores of 4 or 5 who plan to attend medical school should discuss their academic plan with an academic or career adviser early in their academic career. Students should

complete the organic chemistry series (either Chem. 140A-B-C or Chem. 141A-B-C) in their sophomore year.

The lower-division biology (BILD 1-2-3) series or equivalent is also required for most medical schools, along with certain upper-division biology courses, some of which may be counted toward the major requirements in chemistry. Students should meet with the department's undergraduate adviser early in order to plan their courses and discuss their options.

General Chemistry

The General Chemistry Chem. 6 sequence (6A-B-C) is intended for science and engineering majors as well as others who need a quantitative course. It satisfies all preprofessional programs. Chem. 4 is a one-quarter preparation for 6A, which should be taken only by those whose college adviser so recommends. The Honors General Chemistry sequence (6AH-6BH-6CH) is designed for science and engineering majors with strong preparation in science and mathematics. A student intending to major in chemistry can thus begin with 4, 6A, or 6AH depending on the level of preparation. A student intending to major in a discipline other than chemistry should consult his or her adviser in the appropriate department to determine which chemistry course is recommended.

Chem. 11, 12, 13 is a terminal sequence for non-science/non-engineering majors. Chem. 15 is a one-quarter survey course suitable for non-science majors. Students should check with their college adviser to determine applicability toward general-education requirements.

General Information on Undergraduate Major Programs

The minimum passing grade is a D, though students may not graduate with more than one D grade in upper-division required course work and must maintain a minimum of a 2.0 average GPA in the major. All courses for the major, except for independent research (Chem. 199) and chemistry instruction (Chem. 195), must be taken for a letter grade. Chem. 195 and Chem. 199 must be taken on a P/NP basis. All chemistry majors, including transfer students, must complete forty-eight units of upper-division chemistry course work at UCSD and fulfill the campus senior residency requirement.

In addition to the requirements, Math. 20F (required for chemical physics majors) and a course in computer programming are also recommended.

Any departure from the requirements outlined below must be approved by petition. This applies to lower- and upper-division requirements.

The suggested programs following each of the major descriptions are only examples.

All undergraduate degree programs, unless otherwise noted, are certified by the American Chemical Society.

Biochemistry/ Chemistry Major

The Biochemistry/Chemistry major deals with the chemical processes in living organisms, including structure and function of nucleic acids and proteins. It is suitable for those planning to go to graduate school as well as medical, dental, veterinary, and other professional schools. It is also suitable at the bachelor's level for jobs in the biotechnology or pharmaceutical field.

The following courses must be taken for a letter grade:

Lower-Division Requirements

1. General chemistry including laboratory (Chem. 6A-C or 6AH-CH, and 6BL, and 6CL, or equivalent).
2. Calculus (Math. 20A-D, or equivalent).
3. Calculus-based physics including laboratory (Phys. 2A-B and 2D or equivalent, and either 2BL, 2CL or 2DL. Phys. 2CL is recommended and is accessible without Phys. 2C).

Upper-Division Requirements

1. Three quarters of organic chemistry (Chem. 140A-C or 141A-C).
2. Two quarters of physical chemistry (Chem. 126-127 recommended; 131–133 acceptable).
3. One quarter of inorganic chemistry (Chem. 120A).
4. Three quarters of biochemistry (Chem. 114A-C).
5. Five laboratory courses (Chem. 143AM or 143A, 143B, 105A, either 112A or 112B and one additional chemistry lab from the following: Chem. 105B, 106, 112A or 112B, 123, 143C, or 143D).
6. Two elective courses from the following list: Chem. 107, 113/213, 114D, 115/215, 124/225, 116/216, 118, 152/252, 154/254, 155/255, 156/256, 157/257.
7. One additional elective course chosen from among all of the upper-division and graduate courses offered by the Department of Chemistry and Biochemistry (except non-letter-graded courses) **or** from the following list of courses offered by the Department of Biology (some biology courses will require additional coursework to fulfill prerequisites): BICD 100, BICD 110, BICD 140, BIMM 114, BIMM 120, BIPN 100, BIPN 102, BIPN 140. Other electives may be arranged by petition.

Suggested Program for Biochemistry/Chemistry B.S. Major

Many courses have enforced prerequisites or are offered once per year.

FALL	WINTER	SPRING
FRESHMAN YEAR		
Chem. 6A	Chem. 6B	Chem. 6C
Math. 20A	Math. 20B	Chem. 6BL
	BILD 1*	Math. 20C
SOPHOMORE YEAR		
Chem. 6CL	Chem. 140B	Chem. 140C
Chem. 140A	Chem. 143AM	Chem. 143B
Math. 20D	Phys. 2B	Phys. 2D
Phys. 2A		
JUNIOR YEAR		
Chem. 114A	Chem. 114B	Chem. 105A
Chem. 126	Chem. 127	Chem. 114C
Phys. 2CL		
SENIOR YEAR		
Chem. 120A	Elective Lab**	Elective Lab**
Elective	Elective	Elective

* Recommended, but not required.

** One of these must be Chem. 112A or 112B.

Bioinformatics Major from the Department of Chemistry and Biochemistry

Also see the program information listed under Bioinformatics in the catalog.

The Bioinformatics major offers a rigorous, interdisciplinary training in the new and rapidly evolving field of bioinformatics with a strong

focus on chemistry and biochemistry. Bioinformatics is the field of advanced computational and experimental methods that model the flow of information (genetic, metabolic, and regulatory) in living systems to provide an integrated understanding of the systems properties of model organisms. This is a new and rapidly evolving field in which large volumes of both qualitative and quantitative data will accrue at an increasing pace, and the bioinformatician must have a substantial mastery of both the sciences and engineering. This interdisciplinary specialization will be offered jointly with computer science and engineering, bioengineering, and biological sciences, each with its own set of requirements and electives. The program offered by the Department of Chemistry and Biochemistry is aimed at a student interested in applying and developing tools of bioinformatics for the study of chemical processes in biological systems.

Admission to the Bioinformatics Major

There is a fifty-student limit in all combined bioinformatics majors on campus. As a result, admission to the bioinformatics degree is not guaranteed, but is based on a screening process which evaluates potential majors based on academic excellence. Since bioinformatics is an interdisciplinary major, a steering committee involving faculty from the participating departments will select among the best candidates applying and recommended through each department, while insuring active participation of the departments and divisions offering the major. The final decision on admission to the pre-major and major will be made by the bioinformatics steering committee, in consultation with the departments.

Chemistry and Biochemistry candidates for the major should enroll as either chemistry (major code Chem. 25) or biochemistry (major code Chem. 31) majors until they have completed their screening courses in the first two years and have been admitted to the bioinformatics major.

Freshmen

Freshmen may apply to the bioinformatics pre-major after completing the initial screening courses:

- Math. 20B
- Math. 20C
- BILD 1
- Chem. 6A

Once admitted to the pre-major, students may take CSE 11 and 12. On completion of those courses, students may apply for admission to the major. Admission is based on the number of seats available and the applicant's GPA in the six screening courses (Math. 20B-C, BILD 1, Chem. 6A, CSE 11, CSE 12).

Continuing Students

Students who have not declared the bioinformatics pre-major, but who have completed the screening courses, may apply for entry to a bioinformatics program after six quarters (the end of the sophomore year). They will be admitted on a space-available basis, after pre-majors have been screened for admission to the major.

Transfer Students

Effective fall 2003, applicants seeking admission to a bioinformatics major must have completed the following courses with a strong GPA that is competitive with that of UCSD students applying for entry into this specialization:

- a year of calculus (equivalent to Math. 20A-B-C)
- a year of general chemistry, with lab (equivalent to Chem. 6A-B-C, and 6BL)
- the highest level programming course offered at the community college (equivalent to CSE 11 and 12)
- one semester of biology (equivalent to BILD 1 and BILD 2)

Those who have not completed the equivalent courses may be admitted as pre-majors, using the same criteria that apply for UCSD students, and will be allowed a maximum of three quarters to complete pre-major requirements. Transfer students are therefore encouraged to complete these requirements at the community college.

The following courses must be taken for a letter grade:

Lower-Division Requirements

1. Calculus and linear algebra (Math. 20A-C, 20F)
2. General chemistry including laboratory (Chem. 6A-C or 6AH-CH, and 6BL, or 6CL).
3. Physics (Phys. 2A-B)
4. Biology (BILD 1-2)
5. Computer programming (CSE 11-12)
6. Mathematics for algorithm and systems (CSE 21/Math. 15B)
7. Bioinformatics seminar (BILD 94)

The department recommends that students complete an introductory C programming course before taking CSE 11 and CSE 12, either in their first year or during the summer between their first and second years.

Upper-Division Requirements

1. Two quarters of organic chemistry (Chem. 140A-B)
2. Organic chemistry (Chem. 140C) or structural biochemistry (Chem. 114A)
3. Metabolic biochemistry (Chem. 114B)
4. Physical chemistry (Chem. 127 accepted, Chem. 131 *and* 132 recommended)
5. Molecular and cellular biochemistry (Chem. 114D)
6. Two quarters of biochemistry laboratory (Chem. 112A-112B)
7. Genetics (BICD 100)
8. Cell biology (BICD 110)
9. Two computer science courses (CSE 100 *or* Math. 176; and CSE 101 *or* Math. 188)
10. Two additional upper-division electives offered by the Department of Chemistry and Biochemistry (each course must be at least four units) with only one quarter of credit allowed for any given course. Recommended courses are: Chem. 115, 118, and 143A.

The bioinformatics series comprising the following courses:

11. Molecular sequence analysis (BIMM 181 or CSE 181 or BENG 181)
12. Biological databases (Chem. 182 or BIMM 182 or CSE 182 or BENG 182)
13. Applied genomic technologies (BENG 183)
14. Computational molecular biology (BIMM 184 or CSE 184 or BENG 184)
15. Bioinformatics lab (BIMM 185)
16. Probability and statistics (Math. 186)

Suggested Program for the Bioinformatics B.S. from the Department of Chemistry and Biochemistry

Many courses have enforced prerequisites or are offered once per year.

FALL	WINTER	SPRING
FRESHMAN YEAR		
Chem. 6A	Chem. 6B	Chem. 6C
Math. 20A	BILD 1	Chem. 6BL
	Math. 20B	Math. 20C
		BILD 94
SOPHOMORE YEAR		
CSE 11	Chem. 140A	Chem. 112B*
BILD 2	CSE 12	Chem. 140B
Phys. 2A	Phys. 2B	CSE 21/ Math. 15B
JUNIOR YEAR		
Chem. 114A/140C	Chem. 114B*	Elective
BICD 100	Chem. 114D*	BIMM 181/ BENG 181/ CSE 181
CSE 100/Math 176*	Math. 186	
Math. 20F	CSE 101/ Math. 188	BICD 110
SENIOR YEAR		
Chem. 182/ BIMM 182/ BENG182/CSE 182	Chem. 112A* Chem. 127* BIMM 184/ BENG 184/CSE184	BIMM 185 Elective
BENG 183		

* Certain prerequisite courses are waived for the bioinformatics majors. See the department adviser for details.

Chemical Education Major

The Chemical Education major offers an excellent preparation for teaching physical science in secondary schools, including chemistry, physics, earth science, biology, and mathematics.

The chemical education program is sufficiently intensive that students with this degree should be admissible as graduate students in chemistry, biochemistry, and teacher education programs at most universities. This program is also excellent preparation for students interested in a career in science writing.

The program is basically a chemistry major with earth science and biochemistry as electives, combined with three courses in the Teacher Education Program.

If you are interested in earning a California teaching credential through UCSD, contact the Teacher Education Program for information about the prerequisite and professional preparation requirements. It is recommended that you contact TEP as early as possible in your academic career.

The following courses must be taken for a letter grade:

Lower-Division Requirements

1. General chemistry including laboratory (Chem. 6A-C or 6AH-CH, and 6BL, and 6CL, or equivalent).
2. Calculus (Math. 20A-D, or equivalent).
3. Calculus-based physics including laboratory (Phys. 2A-B and 2D or equivalent, and either 2BL, 2CL or 2DL. Phys. 2CL is recommended and is accessible without Phys. 2C).
4. Biology (BILD 1).

Upper-Division Requirements

1. Three quarters of organic chemistry (Chem. 140A-C or 141A-C).
2. Two quarters of physical chemistry (Chem. 126-127 recommended; 131-133 acceptable).
3. One quarter of inorganic chemistry (Chem. 120A).
4. One quarter of biochemistry (Chem. 114A).
5. Five laboratory courses (Chem. 143AM or 143A, 143B, 105A, and two of the following: 105B, 106, 112A-112B, 123, 143C, or 143D).
6. One additional elective course chosen from among all of the upper-division and graduate courses offered by the Department of Chemistry and Biochemistry (except non-letter graded courses).
7. Two earth science courses (Erth. 101 and Erth. 102 or 103). Other biology or chemistry courses may be arranged by petition.
8. Chem. 195, or 196, or 199. Chem. 195 is recommended.
9. TEP 129A-B-C.

Suggested Program for Chemical Education B.S. Major

Many courses have enforced prerequisites or are offered once per year.

FALL	WINTER	SPRING
FRESHMAN YEAR		
Chem. 6A	Chem. 6B	Chem. 6C
Math. 20A	BILD 1	Chem. 6BL
	Math. 20B	Math. 20C
SOPHOMORE YEAR		
Chem. 6CL	Chem. 140B	Chem. 140C
Chem. 140A	Chem. 143AM	Chem. 143B
Math. 20D	Phys. 2B	Phys. 2D
Phys. 2A		
JUNIOR YEAR		
Chem. 126	Chem. 127	Phys. 2CL
Erth. 101	Elective Lab Erth. 102/103	Elective
SENIOR YEAR		
Chem. 114A	Chem. 105A	Elective Lab
Chem. 120A	Chem. 195/196/199	
TEP 129A	TEP 129B	TEP 129C

Chemical Physics Major

The Chemical Physics major applies the concepts and quantitative methods of physics to the descriptions of atoms and molecules, analyzes matter as a statistical assembly of molecular building blocks, and develops and exploits physical (largely spectroscopic) experimental tools with which to test and refine such theories.

The chemical physics major is designed as a preparation for graduate work in chemistry, physics, or other interdisciplinary areas.

The following courses must be taken for a letter grade:

Lower-Division Requirements

1. General chemistry including laboratory (Chem. 6A-C or 6AH-CH, and 6BL, and 6CL, or equivalent).
2. Calculus and linear algebra (Math. 20A-F, or equivalent).
3. Calculus-based physics including laboratory (Phys. 2A-D or equivalent, and either 2BL, 2CL or 2DL. Phys. 2CL is recommended).

It is recommended that the above requirements be completed by the end of the sophomore year.

Upper-Division Requirements

1. Two quarters of organic chemistry (Chem. 140A-B or 141A-B).
2. One year of physical chemistry (Chem. 131-133).
3. Two quarters of inorganic chemistry (Chem. 120A-B). Chem. 114A can substitute for Chem. 120B.
4. Five upper-division chemistry labs: Chem. 105A, 106, 143AM or 143A, 143B or

143C, and one of the following: 105B, 112A, 112B, 123, 143B, 143C, or 143D.

5. Molecular spectroscopy (Chem. 135).
6. Partial differential equations (Math. 110).
7. Two quarters of physics (Phys. 110A-B, or Phys. 100A-B).
8. One additional course in physical chemistry or related areas as approved by the department. Chem. 199 may be petitioned.

Suggested Program for Chemical Physics B.S. Major

Many courses have enforced prerequisites or are offered once per year.

FALL	WINTER	SPRING
FRESHMAN YEAR		
Chem. 6A	Chem. 6B	Chem. 6C
Math. 20A	Math. 20B	Chem. 6BL
		Math. 20C
		Phys. 2A
SOPHOMORE YEAR		
Chem. 140A	Chem. 140B	Chem. 6CL
Math. 20D	Chem. 143AM	Math. 20F
Phys. 2B	Math. 20E	Phys. 2D
	Phys. 2C	
JUNIOR YEAR		
Chem. 131	Chem. 132	Chem. 105A
Chem. 143C	Phys. 2CL	Chem. 133
Phys. 110A/100A	Phys. 110B/100B	Math. 110
SENIOR YEAR		
Chem. 120A	Chem. 106	Chem. 135
Elective Lab	Chem. 120B*	Elective

* Chem. 114A (fall quarter) may be substituted.

Chemistry Major

The Chemistry major provides a broad introduction for the biochemistry, organic, physical, or inorganic student as well as those who prefer not to specialize. This major will enable a student to pursue further studies in chemistry or in related fields of science, medicine, or engineering.

The following courses must be taken for a letter grade:

Lower-Division Requirements

1. General chemistry including laboratory (Chem. 6A-C or 6AH-CH, and 6BL, and 6CL, or equivalent).
2. Calculus (Math. 20A-D, or equivalent).
3. Calculus-based physics including laboratory (Phys. 2A-B and 2D or equivalent, and either 2BL, 2CL or 2DL. Phys. 2CL is recommended and is accessible without Phys. 2C).

Upper-Division Requirements

1. Three quarters of organic chemistry (Chem. 140A-C or 141A-C).
2. Three quarters of physical chemistry (Chem. 131–133).
3. Two quarters of inorganic chemistry (120A-B).
4. One quarter of biochemistry (Chem. 114A).
5. Five laboratory courses (Chem. 143AM or 143A, 143B, 105A and two of the following: Chem. 105B, 106, 112A, 112B, 123, 143C, or 143D).
6. Three additional four-unit upper-division or graduate courses in chemistry and biochemistry or related areas. One of Chem. 195 or 199 may be petitioned.

Suggested Program for Chemistry B.S. Major

Many courses have enforced prerequisites or are offered once per year.

FALL	WINTER	SPRING
FRESHMAN YEAR		
Chem. 6A	Chem. 6B	Chem. 6C
Math. 20A	Math. 20B	Chem. 6BL
		Math. 20C
SOPHOMORE YEAR		
Chem. 6CL	Chem. 140B	Chem. 140C
Chem. 140A	Chem. 143AM	Chem. 143B
Math. 20D	Phys. 2A	Phys. 2B
JUNIOR YEAR		
Chem. 120A	Chem. 120B	Chem. 105A
Chem. 131	Chem. 132	Chem. 133
Phys. 2D	Phys. 2CL	
SENIOR YEAR		
Chem. 114A	Elective Lab	Elective
Elective Lab	Elective	Elective

Chemistry/Earth Sciences Major

The Chemistry/Earth Sciences major is available in cooperation with UCSD's Scripps Institution of Oceanography. It requires course work for a major in chemistry, plus additional courses in geology. It will appeal to students who plan to go on to graduate school in related fields, or to those students who plan to go into professional geologic work with their undergraduate degree.

The following courses must be taken for a letter grade:

Lower-Division Requirements

1. General chemistry including laboratory (Chem. 6A-C or 6AH-CH, and 6BL, and 6CL, or equivalent).
2. Calculus (Math. 20A-D, or equivalent).
3. Calculus-based physics including laboratory (Phys. 2A-B and 2D or equivalent, and either 2BL, 2CL or 2DL. Phys. 2CL is recommended and is accessible without Phys. 2C). Phys. 2C is recommended as preparation for the upper-division Earth Sciences sequence, but it is not required for the major.

Upper-Division Requirements

1. Two quarters of organic chemistry (Chem. 140A-B or 141A-B).
2. Three quarters of physical chemistry (Chem. 131-133).
3. Two quarters of inorganic chemistry (Chem. 120A-B). Chem. 114A can substitute for Chem. 120B.
4. Five upper-division labs: Chem. 105A, 106, 143AM or 143A, Erth. 162L, and one of the following: Chem. 105B, 112A, 112B, 123, 143B-143C or 143D.
5. Five Earth Sciences courses (Erth. 101-103, 120 and 162A).
6. One additional course from the following list: SIO 252, 253, 259, 260, 261, Chem. 149A-149B, 170, 171, 173. Petrology is essential for geology students. SIO 253 should be taken by students planning to go on to graduate school or to do professional geologic work with their undergraduate degrees. Students are encouraged to take at least one quarter of Chem. 199.

Suggested Program for Chemistry/ Earth Sciences B.S.Major

Many courses have enforced prerequisites or are offered once per year.

FALL	WINTER	SPRING
FRESHMAN YEAR		
Chem. 6A	Chem. 6B	Chem. 6C
Math. 20A	Math. 20B	Chem. 6BL
		Math. 20C

SOPHOMORE YEAR		
Chem. 6CL	Chem. 140B	Phys. 2B
Chem. 140A	Chem. 143AM	Phys. 2CL
Math. 20D	Phys. 2A	
JUNIOR YEAR		
Chem. 131	Chem. 132	Chem. 105A
Earth. 101	Earth. 102	Chem. 133
Phys. 2D	Earth. 120	Earth. 103
SENIOR YEAR		
Chem. 114A*	Chem. 106	Elective
Chem. 120A	Earth. 162A	Elective Lab
	Earth. 162L	

* Chem. 120B (winter quarter) may be substituted.

Environmental Chemistry Major

Students have the option of earning the B.A. or the B.S. in the Environmental Chemistry major. The B.S. is ACS certified and is recommended for those who intend to apply to graduate school.

The Environmental Chemistry major requires a strong chemistry background, but also includes breadth courses from other disciplines related to environmental concerns. The elective courses allow specialization in a secondary area of interest, such as economics, political science, biology, earth sciences, or additional chemistry.

The program is designed to prepare students to enter the industrial, governmental, or legal workforce, or to continue studies in the environmental sciences. Students fulfilling their elective requirements with chemistry and biochemistry courses would be prepared to attend most graduate schools in chemical sciences.

The following courses must be taken for a letter grade:

Lower-Division Requirements

1. General chemistry including laboratory (Chem. 6A-C or 6AH-CH, and 6BL, and 6CL, or equivalent).
2. Calculus (Math. 20A-D, or equivalent).
3. Calculus-based physics (Phys. 2A-B and 2D or equivalent). Phys. 2CL (or Phys. 2BL or 2DL) is required for a B.S. degree.

Upper-Division Requirements

1. Two quarters of organic chemistry (Chem. 140A-B or 141A-B).
2. Two quarters of physical chemistry (Chem. 126-127 recommended; 131-133 acceptable).
3. One quarter of inorganic chemistry (Chem. 120A) or a third quarter of organic chemistry (Chem. 140C or 141C).
4. One quarter of biochemistry (Chem. 114A).
5. Two laboratory courses (Chem. 143AM or 143A, 106).
6. Two quarters of environmental chemistry (Chem. 149A-B).
7. Atmospheric chemistry (Chem. 173).

Elective Requirements

1. Four non-science elective courses chosen from the following list (at least one course must be upper-division): Econ. 1, Econ. 3, Econ. 131, Econ. 132, HIUS 154, Phil. 148, Phil. 164, Poli. SCI 160AA, Poli. SCI 160AB, Poli. SCI 162, Soc. 185, USP 2, USP 124, USP 144, USP 171. Environmental chemistry students must complete their elective requirements through coursework and cannot substitute examination scores such as Advanced Placement examinations for these courses.
2. Three science elective courses chosen from the following list (at least two courses must be upper-division): Chem. 105A, Chem. 105B, Chem. 112A, Chem. 112B, Chem. 114B, Chem. 114C, Chem. 120A, Chem. 120B, Chem. 123, Chem. 140C or 141C, Chem. 143B, Chem. 143C, Chem 143D, Chem. 170, Chem. 171, Chem. 199, Erth. 40, Erth. 101, Erth. 102, Erth. 103, BILD 1, BILD 2, BILD 3, BIEB 120, BIEB 121, BIEB 176, BIEB 178, BIEB 179, MAE 118A-B.
3. Students desiring an ACS certified B.S. Degree must take three laboratory courses: Chem. 105A, 143B or 143C, and one from the following list: Chem. 105B, 112A, 112B, 123, 143B, 143C or 143D. These courses may be used to satisfy number 2 above.

Suggested Program for Environmental Chemistry B.A. or B.S. Major (B.S. and ACS certification require additional courses)

Many courses have enforced prerequisites or are offered once per year.

FALL	WINTER	SPRING
FRESHMAN YEAR		
Chem. 6A	Chem. 6B	Chem. 6C
Math. 20A	Math. 20B	Chem. 6BL
	Phys. 2A	Math. 20C
SOPHOMORE YEAR		
Chem. 6CL	Chem. 140B	Phys. 2D
Chem. 140A	Chem. 143AM	
Math. 20D	Phys. 2B	
JUNIOR YEAR		
Chem. 126	Chem. 127	Chem. 173
Chem. 149A	Chem. 149B	Elective
Elective	Elective	Elective
SENIOR YEAR		
Chem. 114A	Chem. 106	Elective
Chem. 120A*	Elective	Elective

*Chem. 140C may be substituted.

Molecular Synthesis Major

The Molecular Synthesis major offers a thorough training in all aspects of the molecular synthesis of organic, inorganic, and biological substances, and with a fundamental understanding of their structure and reactivity. This major provides an excellent preparation for employment in biotechnology, diagnostic, electronic, and pharmaceutical enterprises as well as for graduate programs in organic, bioorganic, and inorganic chemistry.

The following courses must be taken for a letter grade:

Lower-Division Requirements

1. General chemistry including laboratory (Chem. 6A-C or 6AH-CH, and 6BL, and 6CL, or equivalent).
2. Calculus (Math. 20A-D, or equivalent).
3. Calculus-based physics including laboratory (Phys. 2A-B and 2D or equivalent, and either 2BL, 2CL or 2DL. Phys. 2CL is recommended and is accessible without Phys. 2C).

Upper-Division Requirements

1. Three quarters of organic chemistry (Chem. 140A-C or 141A-C)
2. Three quarters of physical chemistry (Chem. 131-133)
3. Two quarters of inorganic chemistry (Chem. 120A-120B)
4. One quarter of biochemistry (Chem. 114A)
5. Five laboratory courses (Chem. 105A, 143A or 143AM, 143B-143C, and 123)
6. Synthetic methods (Chem. 152)
7. Structural or mechanistic organic chemistry (Chem. 154 or 156)

8. Polymer, bioorganic, or bioinorganic chemistry (Chem. 107 or 124 or 157)
9. One additional course from the following: Chem. 114B, 114C, 155, 185, or 199

Suggested Program for Molecular Synthesis B.S. Major

Many courses have enforced prerequisites or are offered once per year.

FALL	WINTER	SPRING
FRESHMAN YEAR		
Chem. 6A	Chem. 6B	Chem. 6C
Math. 20A	Math. 20B	Chem. 6BL
		Math. 20C
SOPHOMORE YEAR		
Chem. 6CL	Chem. 141B	Chem. 141C
Chem. 141A	Chem. 143AM	Chem. 143B
Math. 20D	Phys. 2B	Phys. 2CL
Phys. 2A		Phys. 2D
JUNIOR YEAR		
Chem. 120A	Chem. 120B	Chem. 105A
Chem. 131	Chem. 123	Chem. 133
Chem. 143C	Chem. 132	
SENIOR YEAR		
Chem. 114A	Chem. 154/156	Chem. 107/
Chem. 152	Elective	124/157

Pharmacological Chemistry Major

The Pharmacological Chemistry major provides a strong background in chemistry and includes most courses required by California pharmacy schools. The major is intended primarily to prepare students for pharmacy school (Pharm.D.). Students fulfilling their elective requirements with appropriate courses would be prepared for graduate school to obtain a Ph.D. in pharmacology, biochemistry, or other areas of science. Degree recipients would also be prepared for most jobs in the biotechnology and chemical industries.

Pharmacological chemistry students are strongly encouraged to complete a full year of general chemistry and a full year of lower-division biology. As with some medical programs, some pharmacy programs may require a full year of these courses and may not accept tests such as the Advanced Placement exam to satisfy these requirements.

The following courses must be taken for a letter grade:

Lower-Division Requirements

1 Biology (BILD 1, 2 and 3, and either BICD 101, 111, 131, or BIPN 105 or BIMM 121). Alternatively, a year of biology with laboratory at a community college may be petitioned.
2. General chemistry including laboratory (Chem. 6A-C or 6AH-CH , and Chem. 6BL, and CL, or equivalent).
3. Calculus-based physics including laboratory. (Phys. 2A-B and 2D or equivalent, and either 2BL, 2CL, or 2DL. Phys. 2CL is recommended and is usually the course required by pharmacy schools. It is accessible without Phys. 2C).
4. Calculus (Math. 20A–D, or equivalent).
5. Economics (Econ. 1 or 3 or equivalent).
6. Pharmacology seminar (Chem. 92).

Most California pharmacy schools require a course in public speaking for admission to the school. Students planning to apply to these programs should take Introduction to Speech, Theatre THGE 25, or an appropriate course at a community college.

Upper-Division Requirements

1. Two quarters of physical chemistry (Chem. 126-127 recommended; 131–133 acceptable).
2. Three quarters of organic chemistry (Chem. 140A-C or 141A-C).
3. Three quarters of biochemistry (Chem. 114A-B-C).
4. Three laboratory courses (Chem. 143AM or 143A, 143B and either 112A, 112B or 143C).
5. One quarter of pharmacology and toxicology (Chem. 118).
6. One chemistry elective course chosen from among all the upper-division and graduate courses offered by the Department of Chemistry and Biochemistry (except non-letter graded courses).

If ACS certification is desired, Chem. 120A, plus two additional laboratory courses (Chem. 105A and a lab chosen from Chem. 105B, 106, 123, or 143C/112A/112B, if not already taken), are required. Any of these courses would satisfy #6. above.

Suggested Program for Pharmacological Chemistry B.S. Major (ACS certification requires additional courses)

Many courses have enforced prerequisites or are offered once per year.

FALL	WINTER	SPRING
FRESHMAN YEAR		
Chem. 6A	Chem. 6B	Chem. 6C
Math. 20A	Math. 20B	Chem. 6BL
	BILD 1	Chem. 92
		Math. 20C
SOPHOMORE YEAR		
Chem. 6CL	Chem. 140B	Chem. 140C
Chem. 140A	Chem. 143AM	Chem. 143B
Math. 20D	Phys. 2A	Phys. 2B
JUNIOR YEAR		
Chem. 114A	Chem. 114B	Chem. 114C
Chem. 143C*	Econ. 1/3	BILD 3
Phys. 2D	BILD 2	Phys. 2CL
SENIOR YEAR		
Chem. 126	Chem. 127	Chem. 118
Elective	Bio. lab**	

* Chem. 112A or 112B may be substituted.

** BICD 101, 111, 131, or BIPN 105 or BIMM 121 (some have prerequisites that must be taken in an earlier quarter).

Honors Program

The Department of Chemistry and Biochemistry offers an Honors Program to those students who have demonstrated excellence in any of the nine majors. Students are eligible for Departmental Honors at graduation when they have:

1. Achieved a GPA of 3.2 overall and 3.4 in chemistry courses.
2. Completed a minimum of eight units of Chem. 199, distributed over at least two quarters. A student who registers for 199 and subsequently fails to complete the Honors Program may apply up to four units to any major that normally allows 199 as elective credit. A student who has successfully petitioned to use a Chem 199 course to fulfill elective credit may not use that course to fulfill honors requirements as well.
3. Submitted a final honors research report to three UCSD faculty members, including their research adviser, for approval.
4. Presented an oral report about their research before a group of at least three faculty. This can be at an undergraduate research

conference or at a seminar involving honors students and faculty.

Students who are interested in the Honors Program should contact the Undergraduate Coordinator in 4010 York Hall, and are invited to do so at any time.

Education Abroad

Majors are encouraged to explore the programs that allow students to study abroad or at other U.S. universities for a term or longer. See an adviser for details.

Minor Program in Chemistry and Biochemistry

A typical minor in chemistry consists of three lower-division lecture courses and at least one laboratory course, followed by a minimum of five upper-division courses, including at least one laboratory course, focused in physical, inorganic, organic, environmental chemistry, or biochemistry. Lower-division course requirements may not be satisfied by advanced placement credit, though transfer units may be used to satisfy lower-division minor requirements. Upper-division courses required by a student's major may not be applied toward a minor.

Upper-division courses for the minor must be taken at UCSD in the Department of Chemistry and Biochemistry, and must be taken for a letter grade. The minimum overall GPA requirement for the minor is a 2.0.

The Graduate Programs

Graduate students are accepted to the Department of Chemistry and Biochemistry for study toward Plan I (Thesis) and the Plan II (Comprehensive Examination) M.S. in chemistry, the Ph.D. in chemistry and the Ph.D. in chemistry with specialization in bioinformatics. Students interested in the bioinformatics specialization should contact the Student Affairs Office for more information.

Master's of Science

A Plan I (Thesis) M.S. in chemistry and a Plan II (Comprehensive Examination) M.S. in chemistry are offered.

Admissions: UCSD students are admitted for fall, winter, and spring quarter entrance; non-UCSD students are admitted for fall entrance only. Eligibility requirements for admission include a solid training in the chemical sciences based on the undergraduate record, a 3.0 GPA in chemistry courses completed, and a 3.0 overall GPA.

The GRE general test is required of all applicants. Foreign applicants must submit a TOEFL score; TWE scores are strongly recommended. Those who wish to apply to the Thesis Plan must have a letter of support from the proposed thesis adviser.

Residency and Time to Degree: Master's students must register at UCSD for a minimum of three quarters, and complete at least twenty units per academic year. Full-time Comprehensive Examination Plan students can complete the degree in three quarters. Thesis Plan students typically take eighteen to twenty-four months to graduate.

Relationship to Doctoral Program: Master's students who wish to continue their studies as doctoral students in chemistry and biochemistry must request to transfer to that program. Application materials are due mid-January and include current letters of recommendation, current UCSD transcript, and statement of purpose. Transfer is for fall quarter only.

PLAN I (THESIS)

Purpose: To prepare students for research careers or for doctoral or professional studies; the emphasis is on research.

Advancement to Candidacy: A minimum of thirty-six units with an overall GPA of 3.0 must be completed. The majority of units taken are for thesis research (Chem. 299). At least eight units of graduate level chemistry courses must be completed for a letter grade. Four units of teaching apprenticeship are required (Chem. 500; see Doctoral Program, Teaching and Language Requirement sections). Contact the Student Affairs Office for full information.

Thesis: Students must give an oral presentation and defense of their thesis project to a Thesis Committee. A student graduates after the thesis has been defended and the written dissertation approved by his or her committee, department, and OGSR, and filed with the University Archivist. The Thesis Committee consists of at least three faculty: (1) the thesis adviser, (2) a faculty member from the Department of Chemistry and Biochemistry familiar with the student's research area, and (3) a faculty member from either this or another department whose research is in an area different from that of the thesis.

PLAN II (COMPREHENSIVE EXAM)

Purpose: To prepare students for doctoral or professional studies; the emphasis is on course work.

Advancement to Candidacy: A minimum of thirty-six units with an overall GPA of 3.0 must be completed. The majority of units taken are in letter-graded graduate chemistry courses. Four units of teaching apprenticeship are required (Chem. 500; see Doctoral Program, Teaching and Language Requirement sections). Four units of nonthesis research (Chem. 297) are allowed. Contact the Student Affairs Office for full information.

Comprehensive Examination: The purpose of this requirement is to confirm that students have achieved an advanced understanding of, and a comprehensive training in, the chemical sciences. The tests cover a wide range of material, so that students will have a chance to show what they have learned. For master's students, the department administers the standardized American Chemical Society exams in biochemistry and in analytical, inorganic, organic, and physical chemistry. Students must pass three of the five exams in order to graduate. For doctoral students earning the M.S. on the way to the Ph.D., the Departmental Examination fulfills this requirement.

Doctoral Program

The goal of the Ph.D. in chemistry is to prepare students for careers in science by expanding their knowledge of chemistry while developing their ability for critical analysis, creativity, and independent study. The program is designed to encourage initiative and to stimulate enjoyment and development of the student's area of research expertise as well as the broader aspects of scientific inquiry and enlightenment.

Research

Students choose their research concentration from programs in biochemistry, biophysics, bioinformatics, inorganic, organic, physical, analytical, and theoretical chemistry, surface and materials chemistry, and atmospheric and environmental chemistry. Opportunities for scientific discovery are also abundant through the department's extensive collaborations with investigators in the physical, biological, and engineering sciences. This includes on-campus collaborations

with faculty in the Materials Science Program, School of Medicine, School of Pharmacy and Pharmaceuti-cal Sciences, and Scripps Institution of Oceanography. There are also off-campus interactions with scientists at nearby research facilities such as the Salk Institute and The Scripps Research Institute. Excellent state-of-the-art facilities and equipment support all the research programs. The department's Industrial Relations Program interfaces with national and local chemical, biotechnology, and pharmaceutical industries to encourage technology transfer and to assist postgraduates interested in industrial careers.

Research Adviser

A first-year faculty adviser guides students until a research adviser is chosen. Most of a student's efforts in graduate school are directed toward research for the doctoral dissertation, and selection of a research adviser is of utmost importance. To assist students with this critical decision, all chemistry and biochemistry faculty present research seminars in the fall quarter. Students then rotate in laboratories or consult with faculty to discuss research opportunities. Although students have until the end of the first year to join a laboratory, most start their research studies by mid-year.

Placement Examinations and Course Work

Entering students take written placement examinations in analytical, biochemistry, inorganic, organic, and physical chemistry. The purposes of these exams are to assist with advising and to assure that students have the breadth and level of competence needed for graduate studies. Deficiencies must be remedied in the first year. Three of five exams must be passed, including the one in the student's research area.

First-year students normally take at least six of the graduate courses listed below based on the results of their placement examinations, their research programs, and their specialized interests. Chem. 250 and Chem. 500 are required. Undergraduate courses and courses offered through other departments may also be taken, depending on the student's research area. By the second year, the emphasis is on thesis research, and a lighter load of courses is taken, although participation in seminars and informal study groups continues.

Departmental Examination

In the winter quarter of the second year, a student's progress in research and graduate studies is evaluated through the departmental examination, which includes presentation and critical discussion of a recent research article. Students are also evaluated on their general knowledge of their particular field of study. Students may also be asked about progress on their dissertation.

Qualifying Examination

By the end of the third year, students defend the topic, preliminary findings, and future research plans of their dissertation. Passing this defense qualifies the student to advance to candidacy for the dissertation. A dissertation committee composed of five faculty, one of whom is the research adviser, provides consultation and evaluation for the dissertation project.

Dissertation

The dissertation is normally completed in the fourth or fifth year. This body of research is expected to make an innovative contribution to the field of chemistry. Ph.D. candidates present a seminar summarizing their research accomplishments and defend their thesis in an oral examination before their dissertation committee.

Teaching

Experience in teaching is a vital and integral part of every graduate student's training, and all students participate in the instructional activities of the undergraduate curriculum. Course credit for the teaching apprenticeship is earned by enrolling in Chem. 500. Excellence in teaching is stressed, and the department provides a thorough training program covering the fundamentals of teaching as well as other useful information and techniques for effective instruction. Further training is provided by the campus's Center for Teaching Development. Faculty and the students taught evaluate the performance of teaching assistants every quarter and awards are bestowed annually for outstanding performance as a teaching assistant.

Language Requirement

Students whose native language is not English must demonstrate a mastery of English adequate to complete the teaching requirement. Deficiencies must be remedied by the end of the first year of academic residency. For native English speakers, there is no foreign-language requirement.

Time Limits

In accordance with UCSD policy, students must advance to candidacy by the end of four years. Total university support cannot exceed six and one-third years. Total registered time at UCSD cannot exceed seven and one-third years.

Seminars

Seminars by researchers from other universities, national laboratories, and industry are another basic and important aspect of the graduate curriculum. Seminars are presented weekly in biochemistry, inorganic, organic, and physical chemistry. Department colloquia are given on topics of general interest to the department. Seminars are also sponsored by many other departments and institutes.

Financial Support

The department supports all first-year students in good academic standing from a variety of sources, including teaching and research assistantships, training grants, fellowships, and awards. A stipend is paid in addition to fees and, if applicable, tuition. Continuing students who do not have fellowships or awards are normally supported on training grants or on research assistantships by their thesis advisers.

Admissions

The department seeks bright, motivated doctoral students and welcomes all such applications. To make admissions decisions, the department considers an applicant's statement of purpose and research interests, GRE scores on the general test plus either the advanced chemistry or advanced biochemistry test, undergraduate record, quality of the undergraduate university, letters of recommendation, and research experience and publications. Applicants whose native language is not English must also submit TOEFL scores; TWE scores are strongly recommended. Admissions to the doctoral program is for fall quarter. Applications received by mid-January receive priority consideration.

Students who have a master's degree with strong course records and with research experience are encouraged to apply. They normally pass the Qualifying Examination and graduate at an accelerated pace.

Joint Doctoral Program with San Diego State University

The Department of Chemistry and Biochemistry at UCSD and the Department of Chemistry at San Diego State University offer a joint program of graduate study leading to the Ph.D. degree in chemistry. More information is available in the current edition of the *Bulletin of the Graduate Division* of San Diego State University.

COURSES

LOWER-DIVISION

4. Basic Chemistry (4)
Chemistry 4 is a one-quarter course for science majors with insufficient preparation to start the Chem. 6 sequence. Emphasis is on learning how to solve quantitative problems. Topics include nomenclature, stoichiometry, and the periodic table. Includes a combined laboratory and discussion-recitation each week. *Prerequisite: Math. 4C. A materials fee is required for this course. Cannot be taken for credit after any other chemistry course.* Intended for science majors. (F)

6A. General Chemistry I (4)
First quarter of a three-quarter sequence intended for science and engineering majors. Topics include: stoichiometry, gas laws, bonding, atomic theory, quantum theory, and thermochemistry. Three hours lecture, one hour recitation. *Prerequisites: proficiency in high school chemistry or physics, Math 10A or 20A (may be taken concurrently).* (F,W,S)

6AH. Honors General Chemistry I (4)
First quarter of a three-quarter honors sequence intended for well-prepared science and engineering majors. Topics include: stoichiometry, gas laws, bonding, atomic theory, quantum theory, and thermochemistry. Three hours lecture, one hour recitation. Students may not receive credit for both Chem. 6AH and Chem. 6A. *Prerequisites: proficiency in high school chemistry, physics and mathematics. Concurrent enrollment in Math. 20A or higher level calculus required.* (F)

6B. General Chemistry II (4)
Second quarter of a three-quarter sequence intended for science and engineering majors. Topics include: molecular geometry, condensed phases and solutions, chemical equilibrium, acids and bases and thermodynamics. Three hours lecture, one hour recitation. *Prerequisites: Chem. 6A, Math. 10A or 20A.* (F,W,S)

6BH. Honors General Chemistry II (4)
Second quarter of a three-quarter honors sequence intended for well-prepared science and engineering majors. Topics include: molecular geometry, condensed phases and solutions, chemical equilibrium, acids and bases and thermodynamics. Students may not receive credit for both Chem. 6BH and Chem. 6B. Three hours lecture, one hour recitation. *Prerequisites: Chem. 6AH, Math. 20A.* (W)

6BL. Introductory Inorganic Chemistry Laboratory (3)
Introduction to experimental procedures used in synthetic, inorganic, analytical, and physical chemistry. *Prerequisites: Chem. 6A, 6B. If 6BL is a requirement for your major, it should be taken concurrently with 6C.* A materials fee is required for this course. (F,W,S)

6C. General Chemistry III (4)
Third quarter of a three-quarter sequence intended for science and engineering majors. Topics include: electrochemistry, kinetics, coordination chemistry, nuclear chemistry, and an introduction to organic and biochemistry. Three hours lecture, one hour recitation. *Prerequisite: Chem. 6B, Chem. 6BL may be taken concurrently.* (F,W,S)

6CH. Honors General Chemistry III (4)
Third quarter of a three-quarter honors sequence intended for well-prepared science and engineering majors. Topics include: electrochemistry, kinetics, coordination chemistry, nuclear chemistry, and an introduction to organic and biochemistry. Three hours lecture, one hour recitation. Students may not receive credit for both Chem. 6CH or Chem. 6C. *Prerequisites: Chem. 6BH, Math. 20B. Chem. 6BL may be taken concurrently.* (S)

6CL. Introductory Analytical Chemistry (4)
A laboratory course with emphasis on safe, accurate, and precise experimental techniques in chemistry, including quantitative analysis and instrumental methods, usually taken concurrently with Chem. 6C, but required for only certain majors. *Prerequisite: Chem. 6BL.* A materials fee is required for this course. (F,W,S)

11. The Periodic Table (4)
Introduction to the material world of atoms and small inorganic molecules. Intended for nonscience majors. Can be skipped by students with good knowledge of high school chemistry. Cannot be taken for credit after any other general chemistry course. (F)

12. Molecules and Reactions (4)
Introduction to molecular bonding and structure and chemical reactions, including organic molecules and synthetic polymers. Intended for nonscience majors. *Prerequisite: Chem. 11 or good knowledge of high school chemistry.* Cannot be taken for credit after any organic chemistry course. (W)

13. Chemistry of Life (4)
Introduction to biochemistry for nonscience majors. *Prerequisite: Chem. 12.* Cannot be taken for credit after any biochemistry course. (S)

15. Chemistry of the Universe (4)
This is a one-quarter, nonmathematical chemistry course for nonscience majors covering the origin of the universe, the elements, and the formation of the solar system. The evolution of the Earth's atmosphere, hydrosphere, geosphere, and biosphere will be covered, as well as contemporary problems in environmental chemistry. Cannot be taken for credit after any other chemistry course.

87. Freshman Seminar in Chemistry and Biochemistry (1)
This seminar will present topics in chemistry at a level appropriate for first-year students.

90. Undergraduate Seminar (1)
The seminar will focus on a variety of issues and special areas in the field of chemistry.

91. Undergraduate Honors Seminar (1)
A seminar intended for exposing undergraduate students, especially freshmen and sophomores, to exciting research programs conducted by the faculty. Enrollment is limited.

92. Undergraduate Pharmacology Seminar (1)
Selected topics in pharmacology and toxicology.

99. Independent Study (2-4)
Independent literature or laboratory research by arrangement with and under the direction of a member of the Department of Chemistry and Biochemistry faculty. Students must register on a P/NP basis. *Prerequisites: lower-division standing, 3.0 minimum UCSD GPA, consent of instructor and department, completion of thirty units of undergraduate study at UCSD, completed and approved special studies form.*

UPPER-DIVISION

105A. Physical Chemistry Laboratory (5)
Laboratory course in experimental physical chemistry. *Prerequisites: Chem. 6CL and Phys. 2CL or equivalent, Chem. 126 or 127 or 131 or 133.* A materials fee is required for this course. (F,W,S)

105B. Physical Chemistry Laboratory (4)
Laboratory course in experimental physical chemistry. *Prerequisite: Chem. 105A.* A materials fee is required for this course. (F,W,S)

106. Instrumental Analysis Laboratory (4)
Instrumental methods for analytical chemistry emphasizing physical principles underlying both the instruments and the analytical methods. *Prerequisite: Chem. 105A.* A materials fee is required for this course. (W)

107. Synthetic Macromolecules (4)
The chemistry of high polymers with emphasis on synthesis, structure, characterization, and properties. Polymers as materials are important as films, fibers, and elastomers. They play an ever-increasing role in science, technology, and medicine. *Prerequisites: Chem. 140AB or 141AB.* (May not be offered every year.)

112A. Molecular Biochemistry Laboratory (6)
The application of techniques to study protein structure and function, including electrophoresis, protein purification, column chromatography, enzyme kinetics, and immunochemistry. *Prerequisites: Chem. 140A-B-C or 141A-B-C, 143A-B, 114A-B. (Some of these courses may be taken concurrently.)* (**Note**: Students may not receive credit for both Chem. 112A and BIBC 103.) A materials fee is required for this course. (W)

112B. Molecular Biochemistry Laboratory (6)
This laboratory will introduce the students to the tools of molecular biology and will involve experiments with recombinant DNA techniques. *Prerequisites: Chem. 114A-B, Chem. 114C (may be taken concurrently); Chem. 143A and 143B.* (**Note**: Students may not receive credit for both Chem. 112B and BIMM 101.) A materials fee is required for this course. (S)

113. Chemistry of Biological Macromolecules (4)
A discussion of the structural principles governing biological macromolecules, the techniques used in their study, and how their functional properties depend on three-dimensional structure. *Prerequisites:*

elementary organic and physical chemistry. (May not be offered every year.)

114A. Biochemical Structure and Function (4)
Introduction to biochemistry from a structural and functional viewpoint. *Prerequisite: elementary organic chemistry (Chem. 140A or equivalent).* (**Note**: Students may not receive credit for both Chem. 114A and BIBC 100.) (F)

114B. Biochemical Energetics and Metabolism (4)
This course is an introduction to the metabolic reactions in the cell which produce and utilize energy. The course material will include energy-producing pathways: glycolysis, Krebs cycle, oxidative phosphorylation, fatty-acid oxidation. Biosynthesis–amino acids, lipids, carbohydrates, purines, pyrimidines, proteins, nucleic acids. *Prerequisite: Chem. 114A.* (**Note**: Students may not receive credit for both Chem. 114B and BIBC 102.) (W)

114C. Biosynthesis of Macromolecules (4)
This course is a continuation of the introduction to biochemistry courses (114A and 114B). This quarter reviews the mechanisms of biosynthesis of macromolecules–particularly proteins and nucleic acids. Emphasis will be placed on how these processes are controlled and integrated with the metabolism of the cell. *Prerequisite: Chem. 114B.* (**Note**: Students may not receive credit for both Chem. 114C and BIMM 100.) (S)

114D. Molecular and Cellular Biochemistry (4)
This course represents a continuation of 114C, or an introductory course for first- and second-year graduate students, and covers topics in molecular and cellular biochemistry. Emphasis will be placed on contemporary approaches to the isolation and characterization of mammalian genes and proteins, and molecular genetic approaches to understanding eukaryotic development and human disease. *Prerequisites: Chem. 114A-C or consent of instructor.* (May not be offered every year.)

115. Modeling Biological Macromolecules (4)
Use of computer graphics and modeling methods in the study of biological macromolecules. The course will cover basic methods and techniques. The objective is to provide a good working knowledge of the critical features of the methods and to provide a foundation for further study for those who wish to pursue these methods as research topics. *Prerequisite: Chem. 114A or equivalent.* (May not be offered every year.)

116. Chemistry of Enzyme Catalyzed Reactions (4)
A discussion of the chemistry of representative enzyme catalyzed reactions is presented. Enzyme reaction mechanisms and their relation to enzyme structure are emphasized. *Prerequisites: Chem. 140A-C, 114A, and 126 or 131.* (May not be offered every year.)

118. Pharmacology and Toxicology (4)
A survey of the biochemical action of drugs and toxins as well as their absorption and excretion. *Prerequisites: Chem. 141A-B-C (or Chem. 140ABC), Chem. 114A-B-C, or consent of instructor. Priorities will be given to majors in Pharmacological Chemistry.*

120A. Inorganic Chemistry I (4)
The chemistry of the main group elements in terms of atomic structure, ionic and covalent bonding. Structural theory involving s, p, and unfilled d orbitals. Thermodynamic and spectroscopic criteria for structure and stability of compounds and chemical reactions of main group elements in terms of molecular structure and reactivity. *Prerequisite: a general chemistry course. Chem. 140A or 141A or equivalent course is recommended.* (F)

120B. Inorganic Chemistry II (4)
A continuation of the discussion of structure, bonding, and reactivity with emphasis on transition metals and other elements using filled d orbitals to form bonds. Coordination chemistry in terms of valence bond, crystal field, and molecular orbital theory. The properties and reactivities of transition metal complexes including organometallic compounds. *Prerequisite: Chem. 120A.* (W)

123. Advanced Inorganic Chemistry Laboratory (4)
Synthesis, analysis, and physical characterization of inorganic chemical compounds. A materials fee is required for this course. *Prerequisites: Chem. 120A, 120B, 143AM or 143A, and 143B. Chem. 120B and 143B may be taken concurrently.* (W,S)

124. Bioinorganic Chemistry (4)
The role of metal ions in biological systems, with emphasis on transition metal ions in enzymes that transfer electrons, bind oxygen, and fix nitrogen. Also included are metal complexes in medicine, toxicity, and metal ion storage and transport. *Prerequisites: Chem. 6A-B-C, 114A.* (May not be offered every year.)

126. Physical Chemistry (4)
An introduction to physical chemistry with emphasis on biochemical and environmental applications. Quantum mechanics and molecular structure, spectroscopy. *Prerequisites: Chem. 6C, Math. 20D, and Phys. 2D; or consent of instructor.* (F)

127. Physical Chemistry (4)
An introduction to physical chemistry with emphasis on biochemical and environmental applications. Thermodynamics, first and second laws, thermochemistry, chemical equilibrium, solutions, kinetic theory, reaction kinetics. *Prerequisite: Chem. 126 or consent of instructor.* (W)

131. Physical Chemistry (4)
Thermodynamics, chemical equilibrium, phase equilibrium, chemistry of solutions. *Prerequisites: Chem. 6C, Math. 20AB and Math. 20C and Phys. 2AB. Recommended: Math. 20D and Phys. 2D (may be taken concurrently).* (F)

132. Physical Chemistry (4)
Chemical statistics, kinetic theory, reaction kinetics. *Prerequisites: Chem. 131, Math. 20D or 21D; or consent of instructor. Recommended: Phys. 2D.* (W)

133. Physical Chemistry (4)
Quantum mechanics, atomic and molecular spectroscopy, molecular structure. *Prerequisites: Chem. 132 and Phys. 2D; or Chem. 6C, Math. 20D and Math. 20F, and Phys. 2AB; or consent of instructor.* (S)

134. Computer Programming in Chemistry (4)
Use of computer programming in the analysis and presentation of chemical data (statistical analysis, least squares fitting procedures, titration curve interpretation, analysis of radioactive decay series, chemical kinetics, organic synthesis, etc.) *Prerequisites: Math. 20A and 20B or equivalent.* (**Note**: Students may not receive credit for both Chem. 134 and BIBC 115.) (May not be offered every year.)

135. Molecular Spectroscopy (4)
Time-dependent behavior of systems; interaction of matter with light; selection rule. Radiative and nonradiative processes, coherent phenomena, and the density matrices. Instrumentation, measurement, and interpretation. *Prerequisites: Chem. 133 or equivalent. Math. 20D or Chem. 190/290.* (May not be offered every year.)

140A. Organic Chemistry I (4)
Introduction to organic chemistry, with applications to biochemistry. Bonding theory, isomerism, stereochemistry, chemical and physical properties. Introduction to substitution, addition, and elimination reactions. Students may not receive credit for both Chem. 140A and Chem. 141A. *Prerequisite: Chem. 6C or equivalent course in general chemistry. (F,W,S)*

140B. Organic Chemistry II (4)
Continuation of Organic Chemistry I, 140A. Methods of analysis, chemistry of hydrocarbons, chemistry of the carbonyl group. Introduction to the reactions of biologically important molecules. Students may not receive credit for both Chem. 141B and Chem. 140B. *Prerequisite: Chem. 140A (a grade of C or higher in Chem. 140A is strongly recommended).* (F,W,S)

140C. Organic Chemistry III (4)
Continuation of Organic Chemistry I (140A) and Organic Chemistry II (140B). Organic chemistry of biologically important molecules: carboxylic acids, carbohydrates, proteins, fatty acids, biopolymers, natural products. Students may not receive credit for both Chem. 140C and Chem. 141C. *Prerequisite: Chem. 140B (a grade of C or higher in Chem. 140B is strongly recommended).* (F,W,S)

141A. Organic Chemistry (4)
Chem. 141A introduces theoretical and experimental studies of structure and properties of covalent molecules. Both resonance and simple molecular orbital descriptions of organic compounds are introduced and spectroscopic methods for determining electronic and molecular structure are discussed. Organic reactions are introduced with synthetic and mechanistic examples. *Prerequisites: Chem. 6C (6C may be taken concurrently by good students). Prior or concurrent physics recommended.* (**Note**: Students may not receive credit for both Chem. 141A and Chem. 140A.) (F)

141B. Organic Chemistry (4)
A continuation of Chem. 141A, this course applies the structure-reactivity, spectroscopy, and electronic theories introduced in Chem. 141A to organic reactions. *Prerequisite: Chem. 141A.* (**Note**: Students may not receive credit for both Chem. 141B and Chem. 140B.) (W)

141C. Organic Chemistry (4)
A continuation of Chem. 141A-B, this course treats selected topics such as carbon-metal bonds, organometallic chemistry, electrophilic reactions, free radical reactions, alkane chemistry, polymerization, molecular orbital theory and electrocyclic reactions, photochemistry, unstable intermediates such as carbenes, benzyne, etc., and metal oxidation reactions, and an introduction to carbohydrate and protein chemistry. *Prerequisite: Chem. 141B.* (**Note**: Students may not receive credit for both Chem. 141C and Chem. 140C.) (S)

143A. Organic Chemistry Laboratory (4)
Introduction to laboratory techniques needed in organic chemistry. Stresses physical methods including separation and purification, spectroscopy, product analysis and effects of reaction conditions. *Prerequisites: Chem. 6BL, Chem. 140A or Chem. 141A.* (**Note**: Students may not receive credit for both Chem. 143A and Chem. 143AM.) A materials fee is required for this course. (F,W,S)

143AM. Advanced Organic Chemistry Laboratory (4)
An organic chemistry laboratory intended for chemistry majors only. It is similar to Chem. 143A, but with emphasis on instrumental methods of product identification, separation, and analysis. *Prerequisites: Chem. 6BL, Chem. 140A or Chem. 141A. (**Note**: Students may not receive credit for both Chem. 143AM and Chem. 143A.) This course is restricted to majors only.* A materials fee is required for this course. (W)

143B. Organic Chemistry Laboratory (4)
Continuation of Chem. 143AM or 143A, emphasizing synthetic methods of organic chemistry. *Prerequisites: Chem. 143AM or 143A, Chem. 140B (may be taken concurrently). Enrollment is limited to majors in the Department of Chemistry and Biochemistry, unless space is available.* A materials fee is required for this course. (W,S)

143C. Organic Laboratory (5)
Identification of unknown organic compounds by a combination of chemical and physical techniques. This course is intended for chemistry majors only. *Prerequisites: Chem. 6CL, 143 AM or 143A, 140C or 141C (may be taken concurrently); 143B suggested. A materials fee is required for this course.* (F)

143D. Molecular Design and Synthesis (4)
Advanced organic synthesis. Relationships between molecular structure and reactivity using modern synthetic methods and advanced instrumentation. Stresses importance of molecular design, optimized reaction conditions for development of practically useful synthesis, and problem-solving skills. *Prerequisites: Chem. 140C and Chem. 143B.* A materials fee is required for this course. (S)

149A. Environmental Chemistry (4)
The chemical basis of air and water pollution, chlorofluorocarbons and the ozone hole, the environmental impact of radioactive waste disposal, mineral resource usage, and nuclear energy. *Prerequisites: Chem. 6A-B-C.* (F)

149B. Environmental Chemistry (4)
Agricultural productivity, biological impact on the environment, deforestation, environmental disasters (fires, nuclear winter, and volcanoes), and organic waste handling. *Prerequisite: Chem. 149A.* (W)

152. Synthetic Methods in Organic Chemistry (4)
(Formerly Chem. 148) A survey of reactions of particular utility in the organic laboratory. Emphasis is on methods of preparation of carbon-carbon bonds and oxidation reduction sequences. *Prerequisites: Chem. 140C or Chem. 141C or consent of instructor.*

154. Mechanisms of Organic Reactions (4)
(Formerly Chem. 147) A qualitative approach to the mechanisms of various organic reactions; substitutions, additions, eliminations, condensations, rearrangements, oxidations, reductions, free-radical reactions, and photochemistry. Includes considerations of molecular structure and reactivity, synthetic methods, spectroscopic tools, and stereochemistry. The topics emphasized will vary from year to year. This is the first quarter of the advanced organic chemistry sequence. *Prerequisites: Chem. 140C or Chem. 141C.*

155. Synthesis of Complex Molecules (4)
(Formerly Chem. 144) This course discusses planning economic routes for the synthesis of complex organic molecules. The uses of specific reagents and protecting groups will be outlined as well as the control of stereochemistry during a synthesis. Examples will be selected from the recent literature. (May not be offered every year.) *Prerequisites: Chem. 152 or 252 or consent of instructor.*

156. Structure and Properties of Organic Molecules (4)
(Formerly Chem. 145) Introduction to the measurement and theoretical correlation of the physical properties of organic molecules. Topics covered include molecular geometry, molecular-orbital theory, orbital hybridization, aromaticity, chemical reactivity, stereochemistry, infrared and electronic spectra, photochemistry, and nuclear magnetic resonance. *Prerequisites: Chem. 140A-B-C or 141A-B-C or the equivalent.*

157. Bioorganic and Natural Products Chemistry (4)
(Formerly Chem. 142) A comprehensive survey of modern bioorganic and natural products chemistry. Topics will include biosynthesis of natural products, molecular recognition, and small molecule-biomolecule interactions. *Prerequisites: Chem. 140C or 141C or consent of the instructor.*

161. Supramolecular Coordination Chemistry (4)
An introduction and survey of modern coordination chemistry. Topics will include structure and bonding of alkali, transition, lanthanide and actinide metals, with emphasis on the first row transition metals; stereochemistry, coordination clusters, molecular solids and nanoparticles. *Prerequisites: Chem. 120A and 120B or equivalent.*

168. Bioenergetics (4)
Chemiosmotic processes in mitochondria and photosynthetic organelles, structure-function relationships of membrane protein apoptosis, a refined view of mitochondrial structure deduced from electron tomography, and the role of proteins encoded by mitochondrial DNA in oxidative phosphorylation. *Prerequisites: Chem. 114 A and Chem. 114B (or equivalents.)*

170. Cosmochemistry (4)
Composition of stars, of planets, of meteorites, and the earth and moon. Nuclear stability rules and isotopic composition of the elements. Chemical properties of solar matter. Origin of the elements and of the solar system *Prerequisite: general chemistry sequence.*

171. Nuclear and Radiochemistry (4)
Radioactive decay, stability systematics, neutron activation, nuclear reactions. Szilard-Chalmers reactions, hot-atom chemistry, radiation chemistry, effects of ionizing radiation. *Prerequisite: general chemistry sequence.*

173. Atmospheric Chemistry (4)
Chemical principles applied to the study of atmospheres. Atmospheric photochemistry, radical reactions, chemical lifetime determinations, acid rain, greenhouse effects, ozone cycle, and evolution are discussed. *Prerequisites: Chem. 6A-6C.* (S)

182. Biological Databases (4)
This course provides an introduction to the features of biological data, how those data are organized efficiently in databases, and how existing data resources can be utilized to solve a variety of biological problems. Object oriented databases, data modeling, and description. Survey of current biological database with respect to above, implementation of database on a biological topic. *Prerequisite: CSE 100 or Math. 176. Bioinformatics majors only.*

185. Introduction to Computational Chemistry (4)
Course in computational methods building on a background in mathematics and physical chemistry. Brief introduction and background in computational theory, molecular mechanics, semi-empirical methods, and ab initio-based methods of increasing elaboration. Emphasis on applications and reliability. *Prerequisites: Chem. 126 or 133 and Math. 20C.* (May not be offered every year.)

190. Mathematical Methods of Chemistry (4)
Applied mathematics useful in kinetics, spectroscopy, thermodynamics, statistical mechanics and quantum mechanics; ordinary and partial differential equations, vector spaces, operators, linear algebra, numerical analysis. *Prerequisites: general chemistry, calculus.* (May not be offered every year.)

195. Methods of Teaching Chemistry (4)
An introduction to teaching chemistry. Students are required to attend a weekly class on methods of teaching chemistry, and will teach a discussion section of one of the lower-division chemistry courses. Attendance at lecture of the lower-division course in which the student is participating is required. (P/NP grades only.) *Prerequisite: consent of instructor.* (F,W,S)

196. Reading and Research in Chemical Education (2 or 4)
Independent literature or classroom research by arrangement with, and under the direction of, a member of the Department of Chemistry and Biochemistry faculty. Students must register on a P/NP basis. *Prerequisites: upper-division standing, 2.5 minimum GPA, consent of instructor and department.* (F,W,S)

199. Reading and Research (2 or 4)
Independent literature or laboratory research by arrangement with, and under the direction of, a member of the Department of Chemistry and Biochemistry faculty. Students must register on a P/NP basis. *Prerequisites: upper-division standing, 2.5 minimum GPA, consent of instructor and department.* (F,W,S)

GRADUATE

206. Topics in Biophysics and Physical Biochemistry (4)
Selection of topics of current interest. Examples: primary processes of photosynthesis; membrane biophysics; applications of physical methods to problems in biology and chemistry, e.g., magnetic resonance, x-ray diffraction, fluctuation spectroscopy, optical techniques (fluorescence, optical rotary dispersion, circular dichroism). Topics may vary from year to year. *Prerequisite: consent of instructor.* (W)

207. Modern NMR Methods (4)
Treats varied pulse sequences, one- and two-dimensional methods, interpretation of relaxation rates, spin-decoupling, multiple quantum filtering, and solvent suppression with application to liquid crystals, membranes, small molecules, proteins, and nucleic acids. *Prerequisite: does not require extensive mathematics, but Chem. 130 recommended.* (May not be offered every year.)

208. Modern Methods in Protein NMR (4)
This course covers modern methods in protein NMR including multinuclear, multidimensional (2-, 3-, and 4D) and gradient enhanced spectroscopy. Experiments covered include, but are not limited to, 1H-15N HSQC, 15N edited Tocsy and Noesy, HCCH-Tocsy and 1H-15N-13C correlated experiments. Students will be able to write complete pulse sequences from the primary literature for implementation on a Bruker spectrometer by the end of the quarter. *Prerequisite: Chem. 207.* (May not be offered every year.)

209. Macromolecular Recognition (4)
Structures and functions of nucleic acids, folding and catalysis of nucleic acids, motifs and domains of proteins, principles of protein-interactions, chemistry of protein/DNA and protein/RNA interfaces, conformational changes in macromolecular recognition. *Prerequisites: biochemistry background and graduate standing, or approval of instructor.*

211. Metabolic Biochemistry (4)
A comprehensive course in biochemistry emphasizing metabolic and human biochemistry. *Prerequisites: physical and organic chemistry; graduate standing.* (F)

213. Chemistry of Biological Macromolecules (4)
A discussion of the structural principles governing biological macromolecules, the techniques used in their study, and how their functional properties depend on three-dimensional structure. Chem. 213 students will be required to complete additional coursework beyond that expected of students in Chem. 113. *Prerequisites: elementary physical and organic chemistry.* (May not be offered every year.)

214. Molecular and Cellular Biochemistry (4)
This course represents a continuation of 114C, or an introductory course for first- and second-year graduate students, and covers topics in molecular and cellular biochemistry. Emphasis will be placed on contemporary approaches to the isolation and characterization of mammalian genes and proteins, and molecular genetic approaches to understanding eukaryotic development and human disease. Chem. 214 students will be required to complete additional coursework beyond that expected of students in Chem. 114D. *Prerequisite: Chem. 114A-C or consent of instructor.* (May not be offered every year.)

215. Modeling Biological Macromolecules (4)
Use of computer graphics and modeling methods in the study of biological macromolecules. The course will cover basic methods and techniques. The objective is to provide a good working knowledge of the critical features of the methods and to provide a foundation for further study for those who wish to pursue these methods as research topics. Chem. 215 students will be required to complete additional coursework beyond that expected of students in Chem. 115. *Prerequisite: Chem. 114A or equivalent.* (May not be offered every year.)

216. Chemistry of Enzyme Catalyzed Reactions (4)
A discussion of the chemistry of representative enzyme catalyzed reactions is presented. Enzyme reaction mechanisms and their relation to enzyme structure are emphasized. Chem. 216 students will be required to complete additional coursework beyond that expected of students in Chem. 116. *Prerequisites: Chem. 140A-B-C, 114A and 126 or 131.* (May not be offered every year.)

218. Macromolecular Biochemistry (4)
A comprehensive course in biochemistry emphasizing structural biochemistry. *Prerequisites: physical and organic chemistry; graduate-student standing.* (F)

219A-B-C. Special Topics in Biochemistry (4-4-4)
This special topics course is designed for first-year graduate students in biochemistry. Topics presented in recent years have included protein processing, the chemical modification of proteins, the biosynthesis and function of glycoproteins, lipid biochemistry and membrane structure, and bioenergetics. *Prerequisites: undergraduate courses in biochemistry. Chem. 114A or equivalent.* (May not be offered every year.)

221. Signal Transduction (4)
The aim of this course is to develop an appreciation for a variety of topics in signal transduction. We will discuss several historical developments while the focus will be on current issues. Both experimental approaches and results will be included in our discussions. Topics may vary from year to year. *Prerequisites: biochemistry and molecular biology.* (May not be offered every year.)

222. Structure and Analysis of Solids (4)
Key concepts in the atomic structure and bonding of solids such as metals, ceramics, and semiconductors. Symmetry operations, point groups, lattice types, space groups, simple and complex inorganic compounds, structure/property comparisons, structure determination with X-ray diffraction. Ionic, covalent, metallic bonding compared with physical properties. Atomic and molecular orbitals, bands versus bonds, free electron theory.

223. Organometallic Chemistry (4)
A survey of this field from a synthetic and mechanistic viewpoint. Reactivity patterns for both main group and transition element organometallic compounds will be discussed and organized according to periodic trends. (May not be offered every year.)

224. Spectroscopic Techniques (4)
Application of physical techniques to the elucidation of the structure of inorganic complex ions and organometallic compounds. Topics covered include group theory, and its application to vibrational, magnetic resonance and Raman spectroscopy. (May not be offered every year.)

225. Bioinorganic Chemistry (4)
The role of metal ions in biological systems, with emphasis on transition metal ions in enzymes that transfer electrons, bind oxygen, and fix nitrogen. Also included are metal complexes in medicine, toxicity, and metal ion storage and transport. Chem. 225 students will be required to complete additional coursework beyond that expected of students in Chem. 124. *Prerequisites: Chem. 6A-B-C and Chem. 114A.* (May not be offered every year.)

226. Mechanistic Aspects of Catalytic Reactions (4)
Mechanisms of substitution and electron transfer reaction of inorganic complexes will be examined from an experimental point of view. A quantitative treatment of rate laws, the steady state approximation and multistep mechanisms of reactions that are catalyzed by soluble transition metal complexes. (May not be offered every year.)

227. Seminar in Inorganic Chemistry (2)
Seminars presented by faculty and students on topics of current interest in inorganic chemistry, including areas such as bioinorganic, organometallic and physical-inorganic chemistry. The course is designed to promote a critical evaluation of the available data in specialized areas of inorganic chemistry. Each quarter three or four different topics will be discussed. *Prerequisite: graduate standing or consent of instructor.* (S/U grades only.)

228. Solid State Chemistry (4)
Survey of the chemistry of semiconductors, superconductors, molecular magnetic materials, zeolites, fast ion conductors, electronically conducting polymers and ceramics. Synethetic techniques such as molecular precursor design, the sol-gel process, electrosynthesis, and high-temperature thermolysis will be covered. (May not be offered every year.)

229. Special Topics in Inorganic Chemistry (2-4)
Selection of topics of current interest. May be repeated for credit when topics vary. (May not be offered every year.)

230. Quantum Mechanics (4)
Concepts and mathematical formalism that are useful for problems of chemical interest: states, representations, operators, eigenvalues and eigenfunctions, time evolution, observables, and measurements. Time-independent perturbation theory. *Prerequisites: Chem. 133 or equivalent; Math. 20D or equivalent; Chem. 190 may be taken concurrently.* (May not be offered every year.)

231. Chemical Kinetics and Molecular Reaction Dynamics (4)
Classical kinetics, transition state theory, unimolecular decomposition, potential energy surfaces; scattering processes and photodissociation processes. *Prerequisite: Chem. 230.* (May not be offered ever year.)

232. Statistical Mechanics of Chemical Systems (4)
Equilibrium statistical mechanics, distribution functions, and partition functions. Boltzman, Bose, and Fermi statistics. The different ensembles; ensemble averages and QM expectation values; derivation of thermodynamic properties of simple systems. *Prerequisites: Chem. 131, 132 and 133, or equivalent.* (May not be offered every year.)

235. Molecular Spectroscopy (4)
Time-dependent behavior of systems; interaction of matter with light; selection rule. Radiative and nonradiative processes, coherent phenomena and the density matrices. Instrumentation, measurement, and interpretation. Chem. 235 students will be required to complete additional coursework beyond that expected of students in Chem. 135. *Prerequisites: Chem. 133 or equivalent; Math. 20D; or Chem. 190/290.* (May not be offered every year.)

236. Atherosclerosis (2 or 4)
Multidisciplinary course integrating topics concerning the pathogenesis of arteriosclerosis, with emphasis on cholesterol and lipoprotein metabolism, and the cellular and biochemical mechanisms of lesion development. Topics include relationship of coronary heart disease to hyperlipoproteinemias, management of risk factors, and therapeutic approaches. Two-hour lectures. Same as Medicine 236. *Prerequisite: biochemistry.* (May not be offered every year.)

237. Essentials of Glycobiology (4)
Advanced elective for graduate/medical students who have had core courses in cell biology or biochemistry. Expert faculty will present a coordinated overview of the field of glycobiology, which explores the structure, synthesis, and functions of sugar chains in biological systems. (May not be offered every year.)

238. Current Topics in Physical Chemistry (4)
Critical reading of current literature; training and practice in presenting oral reports, writing scientific papers and proposals. (May not be offered every year.)

239. Special Topics in Chemical Physics (2-4)
Topics of special interest will be presented. Examples include NMR, solid-state chemistry, phase transitions, stochastic processes, scattering theory, nonequilibrium processes, tensor transformations, and advanced topics in statistical mechanics, thermodynamics, and chemical kinetics. (May not be offered every year.)

240. Electrochemistry (4)
Application of electrochemical techniques to chemistry research. Basic electrochemical theory and instrumentation: the diffusion equations, controlled potential, and current methods. Electro-chemical kinetics, Butler-Volmer, Marcus-Hush theories, preparative electrochemistry, analytical electrochemistry, solid and polymer electrolytes, semiconductor photoelectrochemistry. (May not be offered every year.)

246. Kinetics and Mechanism (4)
Methodology of mechanistic organic chemistry: integration of rate expressions, determination of rate constants, transition state theory; catalysis, kinetic orders, isotope effects, substituent effects, solvent effects, linear free energy relationship; product studies, stereochemistry; reactive intermediates; rapid reactions. (May not be offered every year.)

250. Seminar in Chemistry (2)
Regularly scheduled seminars by first-year graduate students provide opportunities for practice in seminar delivery and for the exploration of topics of general interest. (S/U grades only.) (S)

251. Research Conference (2)
Group discussion of research activities and progress of the group members. *Prerequisite: consent of instructor.* (S/U grades only.) (F,W,S)

252. Synthetic Methods in Organic Chemistry (4)
(Formerly Chem. 248) A survey of reactions of particular utility in the organic laboratory. Emphasis is on methods of preparation of carbon-carbon bonds and oxidation reduction sequences. Chem. 252 students will be required to complete additional coursework beyond that expected of students in Chem. 152. *Prerequisite: Chem. 140C or 141C or consent of instructor.*

254. Mechanisms of Organic Reactions (4)
(Formerly Chem. 247) A qualitative approach to the mechanisms of various organic reactions; substitutions, additions, eliminations, condensations, rearrangements, oxidations, reductions, free-radical reactions, and photochemistry. Includes considerations of molecular structure and reactivity, synthetic methods, spectroscopic tools, and stereochemistry. The topics emphasized will vary from year to year. This is the first quarter of the advanced organic chemistry sequence. Chem. 254 students will be required to complete additional coursework beyond that expected of students in Chem. 154. *Prerequisites: Chem. 140C or Chem. 141C or graduate standing.*

255. Synthesis of Complex Molecules (4)
(Formerly Chem. 244) This course discusses planning economic routes for the synthesis of complex organic molecules. The uses of specific reagents and protecting groups will be outlined as well as the control of stereochemistry during a synthesis. Examples will be selected from the recent literature. Chem. 255 students will be required to complete additional coursework beyond that expected of students in Chem. 155. (May not be offered every year.) *Prerequisites: Chem. 152 or 252.*

256. Structure and Properties of Organic Molecules (4)
(Formerly Chem. 245) Introduction to the measurement and theoretical correlation of the physical properties of organic molecules. Topics covered include molecular geometry, molecular-orbital theory, orbital hybridization, aromaticity, chemical reactivity, stereochemistry, infrared and electronic spectra, photochemistry, and nuclear magnetic resonance. Chem. 256 students will be required to complete additional coursework beyond that expected of students in Chem. 156. *Prerequisites: Chem. 140ABC or 141ABC or the equivalent.*

257. Biorganic and Natural Products Chemistry (4)
(Formerly Chem. 242) A comprehensive survey of modern bioorganic and natural products chemistry. Topics include biosynthesis of natural products, molecular recognition, and small molecule-biomolecule interactions. Chem. 257 students will be required to complete additional coursework beyond that expected of students in Chem. 157. *Prerequisites: Chem. 140C or 141C, 254 or consent of instructor.*

258. Applied Spectroscopy (4)
Intensive coverage of modern spectroscopic techniques used to determine the structure of organic molecules. Problem solving and interpretation of spectra will be strongly emphasized. *Prerequisites: Chem. 254 or consent of instructor.*

259. Special Topics in Organic Chemistry (2-4)
(Formerly Chem. 249) Various advanced topics in organic chemistry. Includes but is not limited to: advanced kinetics, advanced spectroscopy, computational chemistry, heterocyclic chemistry, medicinal chemistry, organotransition metal chemistry, polymers, solid-phase synthesis/combinatorial chemistry, stereochemistry, and total synthesis classics.

261. Supramolecular Coordination Chemistry (4)
An introduction and survey of modern coordination chemistry. Topics will include structure and bonding of alkali, transition, lanthanide, and actinide metals, with emphasis on the first row transition metals; stereochemistry, coordination clusters, molecular solids and nanoparticles. Chem. 261 students will be required to complete additional coursework beyond that expected of students in Chem. 161. *Prerequisites: Chem. 120A, 120B or equivalent; or graduate standing.*

262. Inorganic Chemistry and NMR (4)
A survey of inorganic chemistry to prepare for graduate research in the field, including a detailed introduction to nuclear magnetic resonance (NMR), followed by applications of NMR to structural and mechanistic problems in inorganic chemistry.

268. Bioenergetics (4)
Chemiosmotic processes in mitochondria and photosynthetic organelles, structure-function relationships of membrane protein apoptosis, a refined view of mitochondrial structure deduced from electron tomography and the role of proteins encoded by mitochondrial DNA in oxidative phosphorylation. Chem. 268 students will be required to complete additional coursework beyond that expected of students in Chem. 168. *Prerequisites: Chem. 114 A and Chem. 114B (or equivalents.)*

270A-B-C. Current Topics in Environmental Chemistry (2-2-2)
Seminar series on the current topics in the field of environmental chemistry. Emphasis is on current research topics in atmospheric, oceanic, and geological environments. *Prerequisite: consent of instructor.* (S/U grades only.) (May not be offered every year.)

285. Introduction to Computational Chemistry (4)
Course in computational methods building on a background in mathematics and physical chemistry. Brief introduction and background in computational theory, molecular mechanics, semi-empirical methods, and ab initio-based methods of increasing elaboration. Emphasis on applications and reliability. Chem. 285 students will be required to complete additional coursework beyond that expected of students in Chem. 185. *Prerequisites: Chem. 126 or 133 and Math. 20C.* (May not be offered every year.)

290. Mathematical Methods in Chemistry (4)
Applied mathematics useful in kinetics, spectroscopy, thermodynamics, statistical mechanics, and quantum mechanics; ordinary and partial differential equations, vector spaces, operators, linear algebra, numerical analysis. Chem. 290 students will be required to complete additional coursework beyond that expected of students in Chem. 190. *Prerequisites: general chemistry, calculus.* (May not be offered every year.)

293. Cosmochemistry Seminar (2)
Formal seminars or informal sessions on topics of current interest in cosmochemistry as presented by visiting lecturers, local researchers, or students. *Prerequisite: advanced graduate-student standing.* (S/U grades only.)

294. Organic Chemistry Seminar (2)
Formal seminars or informal puzzle sessions on topics of current interest in organic chemistry, as presented by visiting lecturers, local researchers, or students. *Prerequisite: advanced graduate-student standing.* (S/U grades only.) (F,W,S)

295. Biochemistry Seminar (2)
Formal seminars or informal puzzle sessions on topics of current interest in biochemistry, as presented by visiting lecturers, local researchers, or students. *Prerequisite: advanced graduate-student standing.* (S/U grades only.)

296. Chemical Physics Seminar (2)
Formal seminars or informal sessions on topics of current interest in chemical physics as presented by visiting lecturers, local researchers, or students. *Prerequisite: advanced graduate-student standing.* (S/U grades only.) (F,W,S)

297. Experimental Methods in Chemistry (4)
Experimental methods and techniques involved in chemical research are introduced. Hands-on experience provides training for careers in industrial research and for future thesis research. *Prerequisite: graduate standing.*

298. Special Study in Chemistry (1-4)
Reading and laboratory study of special topics for first-year graduate students under the direction of a faculty member. Exact subject matter to be arranged in individual cases. (S/U grades only.) *Prerequisite: first-year graduate student standing.* (F,W,S)

299. Research in Chemistry (1-12)
Prerequisites: graduate standing and consent of instructor. (S/U grades only.) (F,W,S)

500. Teaching in Chemistry (4)
A doctoral student in chemistry is required to assist in teaching undergraduate chemistry courses. One meeting per week with instructor, one or more meetings per week with assigned class sections or laboratories, and attendance at the lecture of the undergraduate course in which he or she is participating. *Prerequisites: graduate standing and consent of instructor.* (S/U grades only.) (F,W,S)

Chinese Studies

OFFICE: 3084 Humanities and Social Sciences Building, Muir College
http://chinesestudies.ucsd.edu

Professors

Joseph C.Y. Chen, Ph.D., *Physics*
Matthew Y. Chen, Ph.D., *Linguistics, Emeritus*
Joseph W. Esherick, Ph.D., *History*
Germaine A. Hoston, Ph.D., *Political Science*
David K. Jordan, Ph.D., *Anthropology*
Richard P. Madsen, Ph.D., *Sociology*
Barry J. Naughton, Ph.D., *Graduate School of International Relations and Pacific Studies*
Paul G. Pickowicz, Ph.D., *History*
Susan L. Shirk, Ph.D., *Graduate School of International Relations and Pacific Studies*
William S. Tay, Ph.D., *Literature, Emeritus*
Wai-Lim Yip, Ph.D., *Literature*
Yingjin Zhang, Ph.D., *Literature*

Associate Adjunct Professor

Suzanne Cahill, Ph.D., *History*

Assistant Professors

Nancy Guy, Ph.D., *Music*
Marta E. Hanson, Ph.D., *History*
Weijing Lu, Ph.D., *History*

Lecturer With Security of Employment

Ping C. Hu, M.A., *History*

Lecturers

Samuel Cha, M.A., *History*
Qian He, *History*
Wang Wei, M.A., *History*
Wang Xiao, M.A., *History*

Chinese Studies is an interdisciplinary program that allows the student interested in China to utilize the university's offerings in various departments to build a major leading to a B.A. degree. In addition to coordinating courses in the various departments, the Program in Chinese Studies offers courses directly under its own auspices to round out the available offerings.

The Chinese Studies Program combines historical understanding with an emphasis on modern and contemporary China. The Chinese History Program has a strong specialization in late imperial and modern China. A full spectrum of courses on the politics, economics, society, and culture of today's China are offered. Another focal point of research interest is visual culture and cultural history in modern and pre-modern China. The interdisciplinary nature of the program (see departmental affiliation of the participating faculty) can accommodate students of a wide range of interests. In addition to our local resources, the University of California Education Abroad Program (EAP) and Opportunities Abroad Program (OAP) are affiliated with various universities and language institutes in China, Taiwan, Hong Kong, and Singapore. This, together with other academic exchange programs with a number of Chinese universities, provides the possibility of a junior year abroad, including both language courses and courses dealing with various aspects of Chinese studies. Subject to final approval by the program chair, EAP credits may be transferred back to UCSD to coordinate with on-campus offerings. However, at least six of the upper-division courses for the major must be taken at UCSD.

The Major Program

The student choosing a major in Chinese studies must meet the following requirements:

1. Two years of Mandarin Chinese (Chinese Studies 11-12-13 and 21-22-23 or equivalent).
2. History 10-11-12 (East Asian History)
3. Twelve upper-division courses in Chinese studies, including courses taken in at least three departments. At least one of these courses should be a seminar or colloquium in which students would be expected to write a substantial term paper. No more than six upper-division language courses count toward the major requirement.
4. As a rule, only courses taken for a letter grade can satisfy program requirements (major, minor). Exceptions are granted for Chinese Studies 198 and 199.

In principle, the courses included in the Program in Chinese Studies are those campus offerings dealing with China or the Chinese language. Most of the courses listed below are planned by participating departments for the 2004–2005 academic year.

Honors Program

Requirements for admission to the program are:

1. Junior standing
2. A GPA of 3.5 or better in the major
3. Overall GPA of 3.2 or better
4. Recommendation of a faculty sponsor familiar with the student's work
5. Completion of at least four upper-division courses approved by the Program in Chinese Studies
6. Completion of at least one year of Chinese language study.

Students who qualify for honors take a two-quarter sequence of directed study during which they define a research project, carry out the research, and complete a senior thesis.

The completed thesis will be evaluated by a committee consisting of the student's thesis adviser and one other faculty member appointed by the Chinese studies program chair.

The Minor Program

A minor in Chinese studies consists of at least three lower-division courses (a minimum of twelve units) and four upper-division courses (a minimum of sixteen units) taken for a letter grade. These courses should be chosen from three programs or departments. No more than three language courses may apply toward the minor requirement. Only one non-language course taken abroad may be approved for fulfillment of the minor. A list of approved courses is available quarterly from the Program in Chinese Studies.

COURSES

COMMITTEE-SPONSORED COURSES

11-12-13. First-Year Chinese (5-5-5)

21-22-23. Second-Year Chinese (4-4-4)

111-112-113. Third-Year Chinese (4-4-4)

121-122-123. Fourth-Year Chinese (4-4-4)

Each of these year-long sequences begins in the fall term. Students wishing to take more than one Chinese language class in the same quarter must obtain approval from the head of the language program *prior* to enrolling in the second course.

All Chinese language courses have A, D and E tracks for students with no Chinese language background; B track for students with some

Chinese language background; C track for students with Chinese language background other than Mandarin.

150. Intensive Summer Language and Culture Program in China (4)
Intensive language and cultural study in China. Program includes regularly scheduled language classes taught by UCSD faculty members; a cultural program of films, stage performances and lectures; and field trips to villages, urban industrial communities, and places of historical interest. All levels of language proficiency accepted. (Summer)

160/260. Late Imperial and Twentieth-Century Chinese Historical Texts (4)
This course introduces the primary sources used by historians of Late Imperial and Twentieth-Century Chinese history. Reading material includes diaries, newspaper articles, Qing documents, gazetteers, essays, speeches, popular fiction, journal articles, scholarly prose, and field surveys. May be repeated for credit. (P/NP grades only.) *Prerequisite: advanced knowledge of Chinese language and consent of instructor.*

165A-B-C. Business Chinese (4-4-4)
Basic training in oral and written communication skills for business, including introduction to modern business terminology and social conventions. *Prerequisite: two years of Chinese language or equivalent.*

170. History of Science in China (4)
This course is designed to provide a coherent picture of aspects of the development of science in Chinese civilization from ancient times through the eighteenth century. The focus (mathematics, astronomy, medicine, chemistry, etc.) will shift from year to year.

181A. Introduction to Classical Chinese (4)
Introduction to the classical language through Confucius, Mencius, and the other Great Books. The emphasis will be on comprehension and reading ability. *Prerequisite: Chinese Studies 23 or equivalent.*

181B. Introduction to Classical Chinese (4)
Continuation of Chinese Studies 181A. *Prerequisite: Chinese Studies 181A or equivalent.*

181C. Introduction to Classical Chinese (4)
This course is a continuation of 181A and B. Short passages from major historical, literary, and philosophical works are introduced. *Prerequisite: Chinese Studies 181B or equivalent.*

182A. Intermediate Classical Chinese (4)
This course is a continuation of Introduction to Classical Chinese (181A-B-C). Selections from major works written in classical Chinese, such as Laozi, Shijing, etc., will be read. The course emphasizes the structures, function words, the analysis of each sentence, and the comprehension of texts. *Prerequisite: Chinese Studies 181A-B-C or equivalent.*

182B. Intermediate Classical Chinese (4)
This course is a continuation of 182A. Selections from Zhuangzi, Shiji, etc., will be taught. The course emphasizes the structures, function words, the analysis of each sentence, and the comprehension of texts. *Prerequisite: Chinese Studies 182A or equivalent.*

182C. Intermediate Classical Chinese (4)
This course is a continuation of 182B. Selections from I Ching, Hanshu, etc., will be introduced. The course emphasizes the structures, function words, the analysis of each sentence, and the comprehension of texts. *Prerequisite: Chinese Studies 182B or equivalent.*

183. Readings in Classical Chinese (4)
Introduction to major works written in classical Chinese, including poetry and historical documents. *Prerequisite: Chinese Studies 181B or equivalent.*

186A-B-C. Readings in Chinese Economics, Politics, and Trade (4-4-4)
Introduction to the specialized vocabulary relating to Chinese politics, trade, and development. Designed for students in the social sciences or with career interests in international trade, the course will stress reading and translating documents, and the special forms of business correspondence and oral negotiation. *Prerequisite: one year of Chinese.*

196. Directed Thesis Research (4)
B.A. honors thesis under the direction of a faculty member in Chinese studies. This course requires two quarters to complete. An IP grade will be awarded at the end of the first quarter. *Prerequisite: consent of instructor.* (F,W,S)

198. Directed Group Study in Chinese Studies (2 or 4)
Study of specific aspects in Chinese civilization not covered in regular course work, under the direction of faculty members in Chinese studies. (P/NP grades only.) *Prerequisite: consent of instructor.* (F,W,S)

199. Independent Study in Chinese Studies (2 or 4)
The student will undertake a program of research or advanced reading in selected areas in Chinese studies under the supervision of a faculty member of the Program in Chinese Studies. (P/NP grades only.) *Prerequisite: consent of instructor.* (F,W,S)

269. Conversational Mandarin for Medical Students—Beginning (2)
This introductory course is designed to develop a working knowledge of medical Mandarin that will enable the student to communicate with Mandarin-speaking patients. There will be instruction in basic medical vocabulary and grammar, with a focus on taking a medical history. No previous knowledge of Mandarin is required since this is only a conversation course. For graduate and School of Medicine students. (S/U only.)

296. Directed Thesis Research (2-12)
Graduate thesis research under the guidance of a faculty member affiliated with the Program in Chinese Studies.

299. Independent Study in Chinese Studies (2-12)
Independent graduate research under the guidance of a faculty member affiliated with the Program in Chinese Studies.

500. Apprentice Teaching (1-4)
A course in which teaching assistants are aided in learning proper teaching methods by means of supervision of their work by the faculty; handling of discussions, preparation and grading of exams and other written exercises, and student relations. (S/U only.)

DEPARTMENT-SPONSORED COURSES

For description of courses listed below, see appropriate departmental listing. All graduate-level courses require consent of the instructor for undergraduate students. Some departmental offerings have content that varies from year to year. In those cases, Chinese Studies approval is given only when content relates primarily to China.

LOWER-DIVISION

History HILD 10: East Asia: The Great Tradition (staff)

History HILD 11: East Asia and the West (staff)

History HILD 12: Twentieth-Century East Asia (staff)

Literature/LTWL 4C: Fiction and Film in Twentieth-Century Societies: Asian Societies (Zhang)

Music MUS 13AS: World Music: Asia and Oceania (Guy)

UPPER-DIVISION

I. CHINESE CULTURE AND SOCIETY

Anthropology ANRG 170: Traditional Chinese Society (Jordan)

Anthropology ANRG 173: Chinese Popular Religion (Jordan)

History HIEA 119: Religion and Popular Culture in East Asia (Cahill)

History HIEA 137: Women and Family in Chinese History (Hanson)

History HIRE 115: Women in Chinese Religious Traditions (Cahill)

History HITO 102: Religious Traditions: East Asian Religious Tradtions (Cahill)

Music MUS 111: Topics/World Music Traditions (Guy)

Sociology SOC/B 162R: Religion and Popular Culture in East Asia (Staff)

Sociology SOC/D 158J: Religion and Ethics in China and Japan (Staff)

Sociology SOC/D 189: Special Topics in Comparative-Historical Sociology (Madsen)

Visual Arts VIS 105D: The Aesthetics of Chinese Calligraphy

II. CONTEMPORARY CHINA

Communication COSF 145: Communication and Development in China (Staff)

History HIEA 132: History of the People's Republic of China (Pickowicz)

IR/PS IRGN 400: International Relations of the Pacific

IR/PS IRGN 404: Chinese Politics

IR/PS IRGN 461: Doing Business in China (Naughton)

IR/PS IRGN 486: Economic and Social Development of China (Naughton)

Political Science POLI 113B: Chinese and Japanese Political Thought (I)

Political Science POLI 113C: Chinese and Japanese Political Thought (II)

Political Science POLI 130B: Politics in the People's Republic of China (Shirk)

Political Science POLI 131C: The Chinese Revolution (Hoston)

Political Science POLI 232: The Chinese Political System (Shirk)

Sociology SOC/D 188B: Chinese Society (Madsen)

III. LANGUAGE AND LITERATURE

Linguistics 141: Language Structures (Staff)

Literature/LTCH 101: Readings in Contemporary Chinese Literature (Zhang)

Literature/LTEA 100A: Classical Chinese Poetry (Yip)

Literature/LTEA 100B: Modern Chinese Poetry (Yip)

Literature/LTEA 100C: Contemporary Chinese Poetry (Yip)

Literature/LTEA 110A: Classical Chinese Fiction (Staff)

Literature/LTEA 110B: Modern Chinese Fiction (Staff)

Literature/LTEA 110C: Contemporary Chinese Fiction (Staff)

Literature/LTEA 120A: Chinese Films (Staff)

Literature/LTEA 120B: Taiwan Films (Staff)

Literature/LTEA 120C: Hong Kong Films (Staff)

Literature/LTEA 120D: Filming Chinese Literature (Staff)

Literature/LTEN 159B: Chinese Poetry and American Imagination (Yip)

Literature/LTCO 274: Genre Studies—Intercultural Poetics (Yip)

Literature/LTWL 176: Literature and Ideas: Taoism (Yip)

Literature/LTWR 113: Intercultural Writing: Chinese (Yip)

IV. CHINESE HISTORY

Chinese Studies CHIN 170: History of Science in China (Chen)

History HIEA 120: The History of Chinese Culture and Society: The Ancient Imperial Period (Hanson)

History HIEA 121: The History of Chinese Culture and Society: The Middle Imperial Period (Hanson)

History HIEA 122: The History of Chinese Culture and Society: The Late Imperial Period (Hanson)

History HIEA 124/HISC 110: Science in China and the West from Ancient Times to the Seventeenth Century (Hanson/Westman)

History HIEA 126: The Silk Road in Chinese and Japanese History (Cahill)

History HIEA 130: History of the Modern Chinese Revolution: 1800–1911 (Esherick)

History HIEA 131 (IP/GEN 408): History of the Modern Chinese Revolution: 1911–1949 (Pickowicz)

History HIEA 132: History of the People's Republic of China (Pickowicz)

History HIEA 133: Cultural History of Twentieth-Century China (Pickowicz)

History HIEA 137: Women and Family in Chinese History (Hanson)

History HIEA 162: History of Women in China (Hanson)

History HIEA 164: Seminar in Late Imperial Chinese History (Hanson)

History HIEA 167: Special Topics on Modern Chinese History (Esherick)

History HIEA 168: Special Topics in Classical and Medieval Chinese History (Cahill)

History HIEA 170: Colloquium on Science, Technology, and Medicine in China (Hanson)

Visual Arts VIS 128DN: Asian Art History (Staff)

Classical Studies

OFFICE: 3024 Humanities and Social Sciences Building, Muir College (CAESAR office)

Web site: http://orpheus.ucsd.edu/history/ClassicalStud.html

Professors

Georgios H. Anagnostopoulos, Ph.D., *Philosophy*
Arthur Droge, Ph.D., *Early Christianity*
Page Ann duBois, Ph.D., *Classical and Comparative Literature*
Anthony T. Edwards, Ph.D., *Classical Literature and Languages*
Richard E. Friedman, Ph.D., *Hebrew and Comparative Literature*
Edward N. Lee, Ph.D., *Philosophy, Emeritus*
Marianne McDonald, Ph.D., *Theatre*
Alden A. Mosshammer, Ph.D., *History, Emeritus*
Sheldon A. Nodelman, Ph.D., *Visual Arts*

Assistant Professor

Dylan Sailor, Ph.D., *Classical Literature and Languages*

Lecturers

Charles Chamberlain, Ph.D., *Classical and Comparative Literature*
Leslie Collins Edwards, Ph.D., *Classical Literature and Languages*
Eliot Wirshbo, Ph.D., *Classical Literature and Languages*

Classical studies is concerned with the cultures of ancient Greece and Rome—roughly from the time of Homer through the time of St. Augustine—in all of their aspects. This program thus offers undergraduates an opportunity to study the cultures of Greece and Rome through the combined resources of the Departments of History, Literature, Visual Arts, Theatre and Dance, and Philosophy. The study of the ancient Greek and Latin languages themselves serves as the starting point for the broader consideration of specific texts in their literary, intellectual, and historical context. In cooperation with the Judaic Studies Program, moreover, students are provided the opportunity to link the study of ancient Greece and Rome to that of the ancient Near East.

The Major Programs

The Classical Studies Program offers four different degree paths, three within classical studies and one in cooperation with Judaic studies. The majors are Greek, Latin, classics, and Greek and Hebrew. Each consists of a choice of twelve upper-division courses approved for the program and listed below. All courses used to meet requirements for a major in classical studies must be taken for a letter grade and be passed with a grade of C– or better.

GREEK

LTWL 19A-B-C are a prerequisite to the Greek major. Six of the twelve upper-division courses must be LTGK courses numbered 100 and above, but exclusive of LTGK 101. The remaining six courses may be in classical civilization (in English translation), selected from the list of approved courses from history, Lit/World, philosophy, political science, and visual arts, though additional LTGK courses numbered 100 and above (including LTGK 101) are acceptable here. These must be from at least two departments and selected in consultation with the adviser; courses dealing with Greek civilization are strongly preferred.

LATIN

LTWL 19A-B-C are a prerequisite to the Latin major. Six of the twelve upper-division courses must be LTLA courses numbered 100 and above, but exclusive of LTLA 101 and 102. The remaining six courses may be in classical civilization (in English translation), selected from the list of approved courses from history, Lit/World, philosophy, political science, and visual arts, though additional LTLA courses numbered 100 and above (including LTLA 101 and 102) are acceptable here. These must be from at least two departments and selected in consultation with the adviser; courses dealing with Roman civilization are strongly preferred.

CLASSICS

LTWL 19A-B-C are a prerequisite to the classics major. Nine of the twelve upper-division courses must be distributed between LTLA and LTGK courses numbered 100 and above (but exclusive of LTLA 101 and 102 and LTGK 101), six in one literature and three in the other according to the student's emphasis. The remaining three courses may be in classical civilization (in English translation), selected from the list of approved courses

from history, Lit/World, philosophy, political science, and visual arts, though additional LTLA or LTGK courses numbered 100 and above (including LTLA 101 and 102 and LTGK 101) are acceptable here. These must be from at least two departments and selected in consultation with the adviser to reflect the relative emphasis upon the Greek and Latin literatures, but with at least one focusing upon each culture.

GREEK AND HEBREW

Three courses from LTWL 19A-B-C and Cultural Traditions, Judaic 1A-B, to be selected in consultation with the adviser, are a prerequisite to the Greek and Hebrew major. Nine of the twelve upper-division courses must be distributed between LTGK courses numbered 100 and above (but exclusive of LTGK 101) and Judaic Studies 101-102-103 or LTNE courses numbered 100 through 112, six in one literature and three in the other according to the student's emphasis. The remaining three courses may be in ancient Greek and Judaic civilization (in English translation), selected from the list of courses approved for classical studies and from the list of courses approved for Judaic studies, though additional LTGK courses numbered 100 and above (including LTGK 101) or Judaic Studies 101-102-103 or LTNE courses numbered 100 through 112 are acceptable here. These must be from at least two departments and selected in consultation with the adviser (who is selected in accordance with the student's emphasis) to reflect the relative emphasis upon the Greek and Hebrew literatures, but with at least one course from each program.

The Minor Programs

CLASSICAL STUDIES:

A minor in classical studies consists of seven courses from those listed below, of which at least four must be upper-division. A knowledge of the ancient languages is not required. The minor will normally include LTWL 19A-B-C: the Greco-Roman World, and four other courses from the participating departments.

Greek:

See Literature: "The Minor in Literature"

Latin:

See Literature: "The Minor in Literature"

Warren College

A Warren College program of concentration in classical studies normally consists of LTWL 19A-B-C and three of the upper-division courses listed below.

Graduate courses may be taken by undergraduates with consent of the instructor. The faculty of the program welcomes qualified undergraduates in graduate courses.

Additional courses counting toward a major in classical studies are offered on a year-to-year basis, both at the undergraduate and graduate levels. As these often cannot be listed in advance, interested students should consult the program faculty for an up-to-date list.

Honors in Greek, Latin, and Classics

Honors is intended for the most talented and motivated students majoring in Greek, Latin, classics, or Greek and Hebrew. Requirements for admission to the honors program are:

1. Junior standing
2. An overall GPA of 3.5
3. A GPA in the major of 3.7

Qualified students majoring in Greek, Latin, or classics may apply at the end of their junior year to the program faculty on the basis of 1) a thesis proposal (three to four pages) worked out in advance with a classical studies faculty member and 2) a recommendation from that faculty member. It is strongly advised that the proposal be based upon a class paper or project from a course taken towards completion of the major.

The core of the honors program is an honors thesis. The research and writing of the thesis will be conducted over the winter or fall and winter terms of the senior year. Up to four hours of 196 credit to this end may be counted towards the major in place of one of the courses in English translation. A thesis completed by the end of the winter quarter of the senior year will be read and evaluated by the thesis adviser and another member of the program faculty. If the thesis is accepted and the student maintains a 3.7 GPA, departmental honors will be awarded. The level of honors–distinction, high distinction, or highest distinction–will be determined by the program faculty.

Students choosing a major in Greek and Hebrew may complete an honors major as follows: those with an emphasis on Greek must meet the requirements for honors in the Classical Studies Program and work with a thesis adviser from classical studies, but select a second adviser for the thesis from Judaic studies. Those with an emphasis on Hebrew must meet the requirements for honors in the Judaic Studies Program and work with a thesis adviser from Judaic studies, but select a second adviser for the thesis from classical studies.

COURSES

UNDERGRADUATE

Classical Studies 51. Bio-Scientific Vocabulary (Greek-Latin Roots) (4)
Intensive exposure (100 words per week) to Greek and Latin roots, prefixes, and suffixes which form the basis of bio-scientific terminology. Extensive practice in word building and analysis. No knowledge of Greek or Latin required.

Classical Studies 107. Myth, Religion, and Philosophy in Late Antiquity (4)

Classical Studies 111. Topics in Ancient Greek Drama (4)
Close reading and discussion of selected works of ancient Greek drama in translation. (Course may be repeated for credit when topic varies.) *Prerequisite: sophomore standing.*

Classical Studies 196A-B. Honors Thesis (2-4)

Cultural Traditions. Judaic 1A-B (4-4)

Humanities 1. The Foundations of Western Civilization: Israel and Greece (6)
Prerequisite: satisfaction of the Subject A requirement. (W)

Humanities 2. Rome, Christianity, and the Medieval World(6)
Prerequisite: satisfaction of the Subject A requirement. (S)

Humanities 3. Renaissance, Reformation, and Early Modern Europe (4)
Prerequisite: satisfaction of the Subject A requirement. (F)

HIEU 101. Greece in the Classical Age (4)

HIEU 102. The Roman Republic (4)

HIEU 103. The Roman Empire (4)

HIEU 160. Alexander the Great and the Hellenistic World (4)

HIEU 161. The Decline of Rome (4)

HIEU 162. Special Topics in the History of Early Christianity (4)

HIEU 199. Independent Study in Greek and Roman History (4)

LTGK 1-2-3. Beginning and Intermediate Greek (4-4-4)

LTGK 110. Archaic Period (4)

LTGK 112. Homer (4)

LTGK 113. Classical Period (4)

LTGK 120. New Testament Greek (4)

LTGK 130. Tragedy (4)

LTGK 131. Comedy (4)

LTGK 132. History (4)

LTGK 133. Prose (4)

LTGK 134. Epic Poetry (4)

LTGK 135. Lyric Poetry (4)

LTGK 198. Directed Group Study (4)

LTGK 199. Special Studies (2 or 4)

LTLA 1-2-3. Beginning and Intermediate Latin (4-4-4)

LTLA 100. Introduction to Latin Literature (4)

LTLA 111. Pre-Augustan (4)

LTLA 113. Augustan (4)

LTLA 114. Vergil (4)

LTLA 116. Silver Latin (4)

LTLA 131. Prose (4)

LTLA 132. Lyric and Elegiac Poetry (4)

LTLA 134. History (4)

LTLA 135. Drama (4)

LTLA 198. Directed Group Study (4)

LTLA 199. Special Studies (2 or 4)

LTEU 102. Women in Antiquity (4)

LTWL 19A-B-C. (4-4-4)

LTWL 100. Mythology (4)

LTWL 101. What Socrates Knew (4)

LTLW 106. Classical Tradition (4)
Previously LGTN 100, LTEU 100 (May be repeated as topics vary).

Philosophy 101. Plato (4)

Philosophy 102. Aristotle (4)

Philosophy 108. Mythology and Philosophy (4)

Philosophy 199. Independent Study (4)

Pol. Sci. 110A. Citizens and Saints: Political Thought from Plato to Augustine (4)

THHS 103. Ancient Greek Drama in Modern Versions (4)

Visual Arts 11. Western Art I: Prehistoric to Medieval (4)

Visual Arts 120A. Greek Art (4)

Visual Arts 120B. Roman Art (4)

Visual Arts 120C. Late Antique Art (4)

GRADUATE

HIGR 201. The Literature of Ancient History (4)

HIGR 298. Directed Readings in Greek and Roman History (1-12)

LTCO 202A. History of Criticism and Aesthetics (4)

LTCO 210. Classical Studies (4)
Prerequisite: working knowledge of either Greek or Latin.

LTGK 297. Directed Studies (1-12)

LTGK 298. Special Projects (4)

LTLA 297. Directed Studies (1-12)

LTLA 298. Special Projects (4)

Philosophy 201. Greek Philosophy (4)

Philosophy 202. Hellenistic and Roman Philosophy (4)

Philosophy 290. Directed Independent Study (1-4)

The University of California Tri-Campus Graduate Program in Classics

UC IRVINE, UC RIVERSIDE, AND UCSD

What is the UC Tri-Campus Program? This new graduate program joins together into a single faculty more than twenty experts in classics and related disciplines from the three southernmost University of California campuses (Irvine, Riverside, and San Diego). It features an innovative curriculum and program of study that address the practical and theoretical questions confronting the humanities and classics in particular as both enter the twenty-first century.

What are the Program's Goals? The aim of the Tri-Campus Program is to provide an educational environment for pursuing a graduate career in classics that is closely integrated into the main currents of humanistic and social scientific scholarship. The program's faculty recognizes that today and in the future teachers of the classics must possess and develop expertise beyond the standard specialties of the traditional classics Ph.D. degree. Classics programs, in both large research universities and small liberal arts colleges, increasingly feel the pressure to break down the boundaries between disciplines.

To achieve these goals, the program and curriculum are designed around five principles:

- Study the ancient texts and objects in their wider social, cultural, and historical contexts.
- Bring the culture of the ancient Greeks and Romans into the purview of contemporary literary and sociological theory.
- Examine the reception of ancient literature and culture by later cultures and the appropriation of the ancient world by the modern world.
- Pay particular attention to the intersections of Greek and Roman society and culture with each other and with the other cultures of the ancient world.
- Utilize to the fullest the potential of new computing technologies as tools for research and teaching.

These five interdisciplinary principles are embodied in the four Core Courses (Classics 200A, 200B, 200C, and 201). Graduate seminars (Classics 220) and reading courses in Greek and Latin authors (Classics 205) round out the program of studies. This curriculum has been in effect at Irvine since 1995, taught by faculty members from all three campuses.

Where do I apply? The Tri-Campus Program uniquely does not belong to a particular campus but to the University of California. Students who are accepted into the program may enroll at any of the three campuses. Because instruction and administrative functions take place on the Irvine campus, students will normally enroll at Irvine. Applications to the Tri-Campus Graduate Program will be reviewed by an admissions committee composed of members from all three campuses.

Where is the Tri-Campus Program located? UC Irvine is located five miles inland from the Pacific Ocean, fifty miles south of metropolitan Los Angeles, forty-five miles southwest of UC Riverside and seventy-four miles north of UCSD. In addition to its beaches, mountains, and deserts, Southern California offers excellent cultural amenities such as museums, theater, dance, opera, and music.

What are the requirements for admission? Applicants to the program should have a B.A. or equivalent in classics or classical civilization, which normally means that you have had at least three years of one classical language and two of the other. Majors in other disciplines (e.g., comparative literature, history, philosophy, or interdisciplinary fields such as women's studies) are welcome, provided they have sufficient background in Greek and Latin. All applicants must submit Graduate Record Exam (GRE) scores and must have a minimum GPA of 3.0 or the equivalent. If you have completed an M.A. in classics at another institution, you may be admitted with advanced standing and may have the course requirements reduced from the normal three years to two or one. The level of course reduction will be determined by progress evaluation exams administered in the spring quarter of each year.

What would my program of study be like? All students are admitted directly into a program leading to the Ph.D. degree. With the exception of those granted advanced standing because they hold the M.A. degree from another institution, students will be concurrently enrolled in the M.A./Ph.D. program.

Course requirements for the M.A. degree are two years (six quarters) of course work. Minimum course requirements are four quarters of Classics 200A-B-C and 201; four quarters of Classics 205; and four quarters of Classics 220. The normal course load is three 200 level courses each quarter, which may be reduced as determined by progress evaluation exams administered in the spring quarter of each year to students in course work. On approval by the Tri-Campus faculty students may take external graduate seminars in relevant areas outside of classics (at any of the three participating campuses). Other requirements for the M.A. degree are a special set of M.A. examinations, submission of a research paper, and demonstration of a reading knowledge of either German, French, Italian, or equivalent language, by examination or other means.

The M.A. may be a terminal degree. At the end of one's M.A. studies a positive vote of the faculty is necessary for continuation in the Ph.D. program.

For the Ph.D. degree, a third year of course work is required. The minimum course requirements for the Ph.D. degree are four quarters of Classics 200A-B-C and 201; five quarters of Classics 205; and six quarters of Classics 220 or an equivalent course. The normal course load in the third year is three graduate-level courses each quarter, for which Independent Study (Classics 280) under the supervision of a faculty member may be substituted. Students at this level are encouraged to take courses and seminars in relevant areas outside the program. Students must demonstrate reading proficiency in a second modern language by the end of the third year. In order to become a candidate for the Ph.D. and enter the dissertation stage, a student must pass an individually designed set of qualifying examinations, consisting of written examinations in Greek and Latin translation, history, history of literature, and written examinations or lengthy papers in special authors and field, and a final oral examination. These exams should be completed by the end of the fourth year. The expected time for the completion of the Ph.D. is six years. Experience in supervised teaching and/or research activity is normally required during your course of study.

Today, universities and colleges are demanding well-trained classical philologists who are also familiar with the recent movements in literary and sociological theory and are skilled in the use of computer technology in their teaching and research. Our requirements are carefully designed to prepare students for classical studies in the decades to come without compromising the traditional rigor of the field. The UC Tri-Campus Program is purposely small, so that every student will be assured of close personal attention in the attainment of these goals. Tri-Campus graduate students have a voice in the program through their elected graduate representative.

Financial Aid. A variety of fellowships and teaching assistantships is available on a competitive basis to qualified entrants. Among the most prestigious of these are Chancellor's Fellowships, which cover all fees and offer support for four years. Graduate and Professional Opportunity Program (GPOP) fellowships for incoming students with similar awards are also available. Regents' Fellowships are awards in varying amounts to defray fees and expenses. The Thesaurus Linguae Graecae Fellowship (TLG) offers tuition, fees, and a stipend while providing an opportunity for "hands-on" training in computer applications. In addition, the program and the TLG have available several teaching assistantships and research assistantships which also provide a stipend in addition to tuition and fees. Some fourth- and fifth-year TAships will be held at UC Riverside and UCSD. It is the purpose of the program to offer all entering students some form of financial aid. See pp. 8–9 of the UCI Application booklet.

Resources of the Tri-Campus Program. The Department of Classics at UC Irvine, which is the administrative center of the Tri-Campus Program, is housed in pleasant quarters in Humanities Office Building 2. Tri-Campus graduate students avail themselves of

- Superior library holdings in classics and related fields in the combined collections of all nine University of California research libraries, accessed to the holdings of the California Digital Library, and expeditious Interlibrary Loan Services with other U.S. and international libraries.
- The facilities of the Thesaurus Linguae Graecae Project (TLG) at UC Irvine, including the complete TLG data bank, the Classics/TLG Computing Lab, and the large collection of primary texts, commentaries, and reference materials housed in the TLG's Marianne Eirene McDonald Library. Formal (Classics 201) and informal instruction in computer-related methodologies for research and teaching are conducted at the Classics/TLG Computing Lab.
- The Consortium for Latin Lexicography (CLL) at UC Irvine, a collaborative research group whose primary goal is to create a computerized Latin dictionary based on the Thesaurus Linguae Latinae (TLL) in Munich.
- The faculty and program in comparative ancient civilizations at UC Riverside, which are dedicated to a cross-cultural and cross-disciplinary approach to the study of ancient cultures.
- Combined UCI-UCSD Ph.D. program in theater, which has a strong classics component, and the nationally renowned regional theatre at La Jolla.
- Seminars, colloquia, and lectures regularly offered by the Critical Theory Institute at UC Irvine and by the University of California Humanities Research Institute that is housed on the UC Irvine campus. Tri-Campus doctoral students may add an emphasis in critical theory under the supervision of the Committee on Critical Theory. The Tri-Campus Program also has its own colloquia series of lectures by visiting scholars on the three campuses.
- The Southern California Graduate Resource-Sharing Consortium, a cooperative association of the Tri-Campus Program and the graduate classics programs of UCLA and the University of Southern California. Every year a faculty member from each of these units offers a graduate seminar in his or her area of expertise at one of the other units. In the spring of every year faculty and graduate students conjoin at an annual consortium luncheon and lecture by a distinguished visiting scholar.

For further information and an online application to the program, please see the Tri-Campus Program's Web site at http://www.hnet.uci.edu/classics/tricampus/.

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COURSES

UC TRI-CAMPUS GRADUATE PROGRAM IN CLASSICS

Classics 200A. Contemporary Literary Theory and the Classics (4)
An introduction to contemporary literary theory, focusing on important critical approaches to the literary texts. May be repeated for credit as topics vary. Some recent offerings include "Bahktin and Aristophanes" (A. Edwards, fall 1995) and "Classics and Literary Theory" (P. duBois, spring 1995)

Classics 200B. Historical Perspectives on Classical Antiquity (4)
Examines ways in which classical texts and ideas have been received and appropriated for the diverse purposes of ancient and subsequent cultures. May be repeated for credit as topics vary. Some recent offerings include "Platonism" (D. Glidden, winter 1996) and "Vergil & Milton" (D. Sutton, winter 1998).

Classics 200C. Greece and Rome in their Contemporary Cultural Contexts (4)
An introduction to the methods and perspectives of social scientific theory which can be used to study the material and social dimensions of the cultures of ancient Greece and Rome. May be repeated for credit as topics vary. Some recent offerings include "Literature & Society in the 4th Century" (M. Salzman, winter 1997) and "Homer's *Iliad* and the Greek Dark Age" (W. Donlan, spring 1999).

Classics 201. Computing in Classical Studies (4)
An introduction to the latest methods of computing for research and teaching. May be repeated for credit as topics vary.

Classics 205. Concurrent Readings (2)
Concurrent enrollment with advanced undergraduate courses (either Greek 105 or Latin 105) with enhanced readings and separate examinations. May be repeated for credit as topics vary.

Classics 220. Classics Graduate Seminar (4)
Subject matter variable; mainly but not exclusively major literary topics. May be repeated for credit as topics vary. Same as Art History 295 when topic is appropriate. Some recent offerings include "Senecan Tragedy" (W. Fitzgerald, winter 1997), "Production Criticism" (D. Sutton, spring 1997), and "Cleopatra and Egyptomania in Rome" (M. Miles, winter 1999).

Classics 280. Independent Study (4)
Supervised independent research. Subject varies.

Classics 290. Research in Classics (4–4–4)
F, W, S.

Classics 299. Dissertation Research (4–12)
F, W, S. May be repeated for credit. Satisfactory/Unsatisfactory Only.

Classics 399. University Teaching (4–4–4)
F, W, S. Required of and limited to Teaching Assistants.

UC TRI-CAMPUS CLASSICS PROGRAM FACULTY

Thomas F. Scanlon, Ph.D., Ohio State University, *Professor of Classics and Program Director,* UCR (Greek and Roman historiography, ancient athletics)

Georgios Anagnostopoulos, Ph.D., Brandeis University, *Professor of Philosophy,* UCSD (Ancient Greek Philosophy, Ethics, Metaphysics)

Luci Berkowitz, Ph.D., Ohio State University, *Professor Emerita of Classics,* UCI (Greek literary history, computer application to literature)

Theodore F. Brunner, Ph.D., Stanford University, *Professor Emeritus of Classics,* UCI (computer application to classical literature)

Charles Chamberlain, Ph.D., University of California, Berkeley, *Lecturer in Classics and Comparative Literature,* UCSD (Greek and Latin literature, Aristotle, poetics)

Cynthia L. Claxton, Ph.D., University of Washington, *Lecturer in Classics and Graduate Teaching Supervisor,* UCI (Greek prose, historiography)

Walter Donlan, Ph.D., Northwestern University, *Professor Emeritus of Classics and Graduate Adviser,* UCI (early Greek literature, Greek social history)

Page duBois, Ph.D., University of California, Berkeley, *Professor of Classics and Comparative Literature,* UCSD (Greek literature, rhetoric, critical theory, cultural studies)

Arthur Droge, Ph.D., University of Chicago, *Professor of Literature;* Director, Program for the Study of Religion, UCSD (religions of Western Antiquity)

Anthony Edwards, Ph.D., Cornell University, *Professor of Classics and Comparative Literature,* UCSD (epic, Greek comedy, critical theory)

Leslie Collins Edwards, Ph.D., Cornell University, *Lecturer in Classics and Comparative Literature,* UCSD (Homer, Greek drama, education in ancient Greece)

Richard I. Frank, Ph.D., University of California, Berkeley, *Associate Professor of History and Classics,* UCI (Roman history, Latin elegy and satire, classical tradition)

David Glidden, Ph.D., Princeton University, *Professor of Philosophy,* UCR (Greek and Roman philosophy)

Anna Gonosová, Ph.D., Harvard University, *Associate Professor of Art History,* UCI (Byzantine and Medieval art)

Susan Lape, Ph.D., Princeton University, *Assistant Professor of Classics,* UCI (Athenian law, Hellenistic Greek history, comedy, political theory)

Edward N. Lee, Ph.D., Princeton University, *Professor Emeritus of Philosophy,* UCSD (Greek philosophy, Plato)

Marianne McDonald, Ph.D., University of California, Irvine, *Professor of Theatre and Classics,* UCSD (Greek and Roman theatre, ancient drama in modern plays, film, and opera)

Margaret M. Miles, Ph.D., Princeton University, *Associate Professor of Art History,* UCI (Greek and Roman art and archaeology, ancient Sicily, Greek religion)

Alden A. Mosshammer, Ph.D., Brown University, *Professor Emeritus of History,* UCSD (early Christian thought, Greek chronography, early Greek history)

Sheldon Nodelman, Ph.D., Yale University, *Associate Professor of Visual Arts,* UCSD (classical art and architecture, Roman portraiture, critical theory)

Maria C. Pantelia, Ph.D., Ohio State University, *Associate Professor of Classics and Director Thesaurus Linguae Graecae,* UCI (Greek epic poetry, Hellenistic poetry, computer applications to classics)

Wendy Raschke, Ph.D., State University of New York, Buffalo, *Lecturer in Classics,* UCR (Roman satire, Greek art and archaeology)

B. P. Reardon, D.U. Université de Nantes, *Professor Emeritus of Classics,* UCI (Late Greek literature, ancient novel)

Dylan Sailor, Ph.D., University of California, Berkeley, *Assistant Professor of Classics and Comparative Literature,* UCSD (ancient historiography, literature and culture of the Principate, critical theory)

Michele Salzman, Ph.D., Bryn Mawr College, *Associate Professor of History,* UCR (Late antiquity; Roman history and literature, religion, women's studies)

Gerasimos Santas, Ph.D., Cornell University, *Professor of Philosophy,* UCI (ancient philosophy, history of philosophy, ethics)

Patrick Sinclair, Ph.D., Northwestern University, *Associate Professor of Classics,* UCI (Roman historiography, Latin lexicography, rhetoric)

Dana F. Sutton, Ph.D., University of Wisconsin, *Professor of Classics,* UCI (Greek and Latin drama, Greek poetry, Anglo-Latin literature)

Nicholas P. White, Ph.D., Harvard University, *Professor of Philosophy,* UCI (Greek Philosophy, Ethics, Epistemology)

Eliot Wirshbo, Ph.D., University of Pennsylvania, *Lecturer in Classics and Comparative Literature,* UCSD (Greek epic, folklore)

Andrew Zissos, Ph.D., Princeton University, *Assistant Professor of Classics,* UCI (Latin epic, medieval Latin, Roman culture)

Clinical Psychology

OFFICE: 416 and 417, 140 Arbor Drive
(619) 497-6659

Professors

Sonia Ancoli-Israel, Ph.D., *In-Residence/Psychiatry*
Mark I. Appelbaum, Ph.D., *Psychology*
J. Hampton Atkinson, Jr., M.D., *In-Residence/Psychiatry*
Ursula Bellugi, Ed.D., *Adjunct/Psychology*
Gary R. Birchler, Ph.D., *Clinical Psychiatry*
David L. Braff, M.D., *Psychiatry*
Karen Britton, M.D., Ph.D., *In-Residence/Psychiatry*
Gregory G. Brown, *In-Residence/Psychiatry*
Sandra Brown, Ph.D., *Psychology/Psychiatry*
Brett Clementz, Ph.D., *Psychology*
Eric Courchesne, Ph.D., *Neurosciences*
Dean C. Delis, Ph.D., *In-Residence/Psychiatry*
Joel E. Dimsdale, M.D., *In-Residence/Psychiatry*
Mark A. Geyer, Ph.D., *In-Residence/Psychiatry*
Igor Grant, M.D., *Psychiatry*
Robert K. Heaton, Ph.D., *Psychiatry, Program Director*
Terry L. Jernigan, Ph.D., *In-Residence/Psychiatry*
Dilip V. Jeste, M.D., *In-Residence/Psychiatry*
Lewis L. Judd, M.D., *Psychiatry, Chair*
Robert M. Kaplan, Ph.D., *Family and Preventive Medicine, Chair.*
John R. Kelsoe, Jr., M.D., *Psychiatry*
Daniel F. Kripke, M.D., *In-Residence/Psychiatry*
James A. Kulik, Ph.D., *Psychology*
Marta Kutas, Ph.D., *Cognitive Science*
Saul Levine, M.D., *Psychiatry*
James B. Lohr, M.D., *In-Residence/Psychiatry*
Paul J. Mills, Ph.D., *In-Residence/Psychiatry*
Lawrence A. Palinkas, *Family and Preventive Medicine*
Barbara L. Parry, Ph.D., *In-Residence/Psychiatry*
Thomas L. Patterson, Ph.D., *In-Residence/Psychiatry*
David P. Salmon, Ph.D., *In-Residence/Psychiatry*
Laura Schreibman, Ph.D., *Psychology*
Marc A. Schuckit, M.D., *Psychiatry*
David S. Segal, Ph.D., *Psychiatry*
Stephen R. Shuchter, M.D., *Psychiatry*
Larry R. Squire, Ph.D., *In-Residence/Psychiatry*
Murray B. Stein, M.D., *In-Residence, Psychiatry*
Joan Stiles, Ph.D., *Cognitive Science*
Neal R. Swerdlow, M.D., Ph.D., *Psychiatry*
Doris A. Trauner, M.D., *Neurosciences/Pediatrics*
Sidney Zisook, M.D., *Psychiatry*

Associate Professors

Mark W. Bondi, Ph.D., *In-Residence/Psychiatry*
Sandra J. Brown, *Clinical Psychiatry*
Michael P. Caligiuri, Ph.D., *In-Residence/Psychiatry*
Renee Dupont, M.D., *Clinical Psychiatry*
David Feifel, M.D., *In-Residence/Psychiatry*
Ann F. Garland, Ph.D., *In-Residence/Psychiatry*
Eric L. Granholm, Ph.D., *In-Residence/Psychiatry*
Patricia H. Judd, Ph.D., *Clinical Psychiatry*
Jeffrey E. Max, M.D., *In-Residence/Psychiatry*
John R. McQuaid, Ph.D., *Clinical Psychiatry*
Mark G. Myers, Ph.D., *In-Residence/Psychiatry*
Sharon Nichols, *Project Scientist/Neurosciences*
Martin P. Paulus, M.D., *In-Residence/Psychiatry*
William Perry, *In-Residence/Psychiatry*
Georgia Sadler, M.D., *Clinical Surgery*
Tamara L. Wall, Ph.D., *In-Residence/Psychiatry*
Shu-Hong Zhu, *Adjunct/Family and Preventive Medicine*

Assistant Professors

Natacha Akshoomoff, *Adjunct/Psychiatry*
Leslie J. Carver, *Psychology*
Sean Drummond, *In-Residence/Psychiatry*
J. Vincent Filoteo, *In-Residence/Psychiatry*
Tamar Gollan, *Adjunct/Psychiatry*
Frank Haist, *Adjunct/Psychiatry*
Ariel J. Lang, *In-Residence/Psychiatry*
Thomas D. Marcotte, *Adjunct/Psychiatry*
Kristen McCabe, *Adjunct/Psychiatry*
Barton Palmer, *Adjunct/Psychiatry*
Thomas Rutledge, *In-Residence/Psychiatry*
Susan F. Tapert, *In-Residence/Psychiatry*
Julie Wetherell, *In-Residence/Psychiatry*

Professional Researcher

Jeanne Townsend, Ph.D., *Associate Research Scientist/Neurosciences*

The Joint Doctoral Program

The interdisciplinary partnership of the Department of Psychiatry at the UCSD School of Medicine and the Department of Psychology at San Diego State University greatly extends the range of perspectives and furnishes unusual opportunities for graduate study leading to the Ph.D. degree in clinical psychology. The Joint Doctoral Group in Clinical Psychology currently consists of faculty from the UCSD Department of Psychiatry, School of Medicine, and the Departments of Neurosciences, Cognitive Science, Family and Preventive Medicine, and Psychology, and the SDSU Department of Psychology and School of Public Health.

Information regarding admission is found in the current edition of the Bulletin of the Graduate Division of San Diego State University.

The program goal is to train clinical psychologists who are accomplished both as clinicians and as research scientists. The curricula and training provide a strong foundation in clinical psychological concepts, methods, theories, and data, together with intensive concentrations in specialized areas of clinical psychology. Currently our program has three areas of specialization: behavioral medicine, neuropsychology, and experimental psychopathology.

The scientist-practitioner model on which this program is based requires that students receive ongoing supervised research experience, including planning, design, implementation, analysis, and communication of findings. Equally important is extensive supervised experience aimed at developing sound general and specialized clinical skills. Students are expected to be actively involved in all these activities throughout their tenure in the program.

The program is designed as a five-year curriculum, including a one-year clinical internship. The curriculum is based on a twelve-month academic year. The program is accredited by the American Psychological Association.

Specific courses currently required as part of the core at UCSD include: Clinical Psychology 294A,B,C, (required for neuropsychology track majors only); Clinical Psychology 296 (independent study, lab practicum); Clinical Psychology 299 (independent study project); School of Medicine 202E (Psychopathology).

Ph.D. Time Limit Policies

Students must be advanced to candidacy by the end of five years. Total University support cannot exceed six years. Total registered time at UCSD cannot exceed seven years.

COURSES

Clinical Psychology 205. Neuroanatomy (6)
Fundamental anatomy/physiology of human nervous system, emphasizing higher cortical functions. Methods of clinical problem solving in neurology; background in basic neuropsychological skills.

Clinical Psychology 294. Pro-Seminar in Neuropsychology (3)
Year-long course (294A,B,C), each for three credits, offered sequentially fall, winter, spring. Provides a fundamental knowledge of brain-behavior relationships as well as strategies and methods of neuropsychological assessment and rehabilitation.

School of Medicine 202E. Social and Behavioral Sciences–Psychopathology (3)
This sequence will acquaint students with techniques of interviewing, concepts of mental illness and normality, basic research in causality of behavioral disorders, and approaches to treatment, all in the context of a bio-psycho-social frame of reference. Format combines a lecture followed by smaller group sessions with a faculty leader. The groups enable students to meet patients with behavioral disorders, to practice interviewing, to develop observational skills, and to discuss material presented in lectures and assigned readings. (S/U grades only.) *Prerequisite: SOM 202A,C,D or consent of instructor.*

Clinical Psychology 296. Independent Study (1-12)
Independent survey of basic concepts in clinical psychology using various sources of material, including scientific papers in clinical psychology and behavioral science and other sources as seem indicated.

Clinical Psychology 299. Graduate Research (1-12)
Individual study course under one or more of the joint doctoral program faculty to develop certain research questions, design a methodology to answer the questions, and then carry out actual research, data reduction, and analysis.

Clinical Research

OFFICE: La Jolla Village Professional Center,
8950 Villa La Jolla Drive, Suite C215
(858) 964-1017
unexhealthcare@ucsd.edu
http://health-execed.ucsd.edu/mas/crprog.html

Program Director

Ravindra L. Mehta, M.D., *Professor of Clinical Medicine*

Associate Program Directors

Gerry R. Boss, M.D., *Professor of Medicine*
J. Allen McCutchan, M.D., *Professor of Medicine in Residence*

Associated Faculty

Theodore Ganiats, M.D., *Professor, Family and Preventive Medicine*
Daniel Masys, M.D., *Adjunct Professor, Biomedical Informatics*
W. Christopher Mathews, M.D., *Professor of Clinical Medicine*
Deborah L. Wingard, M.D., *Professor, Family and Preventive Medicine*
Michael G. Ziegler, M.D., *Professor of Medicine*

Program Description

The Master of Advanced Studies (MAS) in Clinical Research offers a broad-based curriculum in clinical research methodology and integrates classroom instruction with practical training to provide students with the knowledge and skills necessary to produce valid, credible research. Linking the academic and professional scientific communities, the program is appropriate for physicians, pharmacists, nurses with advanced training, psychologists, and biomedical scientists employed in biomedical firms, hospitals, and pharmacies. The program aims to accommodate the varying needs of the students through its modular approach to instruction, a part-time year-round schedule, and a choice of general electives organized by tracks.

The MAS in Clinical Research is a part-time, self-supporting degree program with a flexible course schedule designed for working professionals and academics. The UCSD graduate division confers the MAS degree and the Department of Medicine in the UCSD School of Medicine is responsible for the academic management of the curriculum. UCSD Extension administers the program and provides student advising and career counseling services.

Admission

New students are admitted in the fall, winter, spring, and summer quarter of each academic year. Prospective candidates should submit and complete the official UCSD online graduate application for admission, the application fee, one set of official transcripts from each institution attended after high school, three letters of professional letters of recommendation, and a current resume or c.v. The GRE/GMAT is not required; however, it is strongly recommended that candidates possess, or currently be pursuing, a graduate degree in a scientific or healthcare related field and also have some level of experience in scientific or clinical research. In some instances candidates without an advanced degree may be admitted to the program if they have demonstrated substantial professional experience in the field at increasing levels of responsibility. The application deadlines are July 15 (fall), October 15 (winter), January 15 (spring), and April 15 (summer).

Program of Study

The part-time master's degree program is designed to be completed in two to three years, depending upon a participant's time to devote to the program. Classes are typically scheduled in the late afternoons and an occasional Saturday for seminars. The thirty-six-unit degree is comprised of sixteen units of core clinical modules, four units of seminar courses, six units of general electives, four units of advanced statistics electives, and six units of an independent study project.

COURSES

CORE CURRICULUM—CLINICAL MODULES

CLRE 250. Patient-Oriented Research I (2)
This course will develop and apply the theory of clinical trials design and analysis, discuss the practical issues of financing and implementing clinical trials, and describe issues of monitoring trials and working in cooperative groups. The scholar will design and present to a group of peers a concept sheet for a phase I/II and phase II/III clinical trial.

CLRE 251. Basic Epidemiology (2)
Scholars will recognize and understand different types of study designs, the relative strengths and limitations of each, and the proper choice of study design in conducting their own research. They will also be able to identify and calculate the correct measure of risk for each study design. Participants will recognize major sources of bias, confounding and misclassification, and understand design and analysis methods of dealing with each. They will also be familiar with criteria to differentiate association from causation.

CLRE 252. Health Services Research (2)
Scholars will evaluate relevant outcomes in patient-oriented research from the patient (quality of life) and societal (economic) perspectives and locate potential resources for assessing the relevant outcomes in a wide variety of study designs. They will also be able to describe the relative strengths of different health services research approaches to a clinical problem. Finally, they will understand the components of clinical practice guidelines, including patient preferences, and how these guidelines both depend upon as well as inform patient-oriented research.

CLRE 253. Basic Biostatistics (2)
Scholars will understand principles of measurement of clinical data, recognize data types, and correctly identify statistical methods appropriate for analysis of a given clinical data set. They will gain experience in assembling a clinical dataset in formats suitable for analysis by STATA or other comparable statistical packages. They will learn skills to conduct graphical and numerical exploratory data analysis, comparative tests of categorical, ordinal, and continuous data, linear and logistic regression analysis, and survival analysis by life table and Kaplan-Meier techniques.

CLRE 254. Advanced Biostatistics (2)
Scholars will understand and conduct advanced biostatistical analyses including: multiple linear and logistic regression, survival analysis, and Cox and extended Cox regression. The scholar will also be familiar with person-time rate analysis with Poisson regression and longitudinal data analysis in the presence of missing values and varying measurement times. *Prerequisite: Basic Biostatistics, CLRE 253.*

CLRE 255. Data Management and Informatics (2)
This course provides an orientation to database design and management and covers key issues regarding data handling for clinical research and clinical trials. Scholars will also become familiar with technology assessment and decision-making methods and analysis.

CLRE 256. Patient-Oriented Research II
This course will review the ethics and basic regulatory issues for research involving human subjects; the principles of data management for clinical research, including architecture, access and confidentiality, and integrity of databases; and skills in graphic and verbal presentation of research data. Scholars will prepare a mock submission to an IRB for peer review and practice presenting graphic and tabular data. *Prerequisite: Patient-Oriented Research I, CLRE 250.*

CLRE 257. Advanced Epidemiology
Scholars will select the appropriate sampling method and determine the sample size necessary for specific projects and adjust for confounding. Participants will be familiar with several specialized analytic techniques, including matched, cluster, and meta-analyses. They will also be familiar with methodological issues, unique to ecological, behavioral, and genetic studies. *Prerequisite: Epidemiology I, CLRE 251.*

Cognitive Science

OFFICE: 140 Cognitive Science Building
http://cogsci.ucsd.edu/cogsci

Professors

Richard C. Atkinson, Ph.D., *UC President, Emeritus*
Richard K. Belew, Ph.D.
Aaron V. Cicourel, Ph.D., *Emeritus*
Jeffrey L. Elman, Ph.D.
Gilles R. Fauconnier, Ph.D.
James D. Hollan, Ph.D.
Edwin Hutchins, Ph.D., *Chair*
Marta Kutas, Ph.D.
Jean M. Mandler, Ph.D., *Emeritus*
Donald A. Norman, Ph.D., *Emeritus*
Martin I. Sereno, Ph.D.
Joan Stiles, Ph.D.
David Zipser, Ph.D., *Emeritus*

Associate Professor

John D. Batali, Ph.D.
David J. Kirsh, D.Phil.
Jaime A. Piñeda, Ph.D.

Assistant Professors

Andrea A. Chiba, Ph.D.
Seana Coulson, Ph.D.
Gedeon O. Deák, Ph.D.
Virginia de Sa, Ph.D.
Rafael Nuñez, Ph.D.
Emanuel Todorov, Ph.D.
Jochen Triesch, Ph.D.

Adjunct Professor

Terrence J. Sejnowski, Ph.D., *Biological Sciences—Neurobiology, Cognitive Science, Computer Science and Engineering, and Neurosciences*

Introduction

Cognitive science is a young and diverse field which is unified and motivated by a single basic inquiry: What is cognition? How do people, animals, or computers 'think,' act, and learn? In order to understand the mind/brain, cognitive science brings together methods and discoveries from neuroscience, psychology, linguistics, philosophy, and computer science. UCSD has been at the forefront of this exciting new field and our Department of Cognitive Science was the first of its kind in the world. It is part of an exceptional scientific community and remains a dominant influence in the field it helped create.

In addition to preparing undergraduates for careers in a variety of sciences, the major also provides an excellent background for many professional fields, including medicine, clinical psychology, and information technology.

The concerns of cognitive science fall into three broad categories: the brain—the neurological anatomy and processes underlying cognitive phenomena; behavior—the cognitive activity of individuals and their interaction with each other and their sociocultural environment, including the use of language, information, and media; and computation—the capacity of mathematical and computer systems to model cognitive and neural phenomena and represent information, and the role of computers as cognitive tools.

The department collaborates closely with other academic departments and research communities, including the Center for Research in Language, the Center for Human Development, the Salk Institute for Biological Studies, the UCSD Medical Center, the San Diego Supercomputer Center, and the UCSD/Salk Institute Functional Magnetic Resonance Imaging Center, providing many outstanding resources and opportunities.

Students are encouraged to participate actively in the department by sharing their ideas about curriculum, research, and other topics with faculty and staff. Undergraduate students may join the Students in Cognitive and Neurosciences (SCANS) organization, which provides opportunities for undergraduates to meet students and faculty from UCSD and other institutes, visit research laboratories, and make job contacts. Graduate students take an especially active role in shaping the department, both academically and administratively, while they gain experience in research, teaching, and managing both labs and department affairs.

The Undergraduate Programs

The department offers both a B.A. and a B.S. degree. The B.S. requires completion of more rigorous lower-division course work and three additional courses at the upper-division level. The B.S. degree may be taken optionally with a specified area of specialization. There is also an honors program for exceptional students in both degree programs. Major Code: CG25.

Please note: Students who officially declared the major before fall 2001 may choose to follow the old major requirements or the new major requirements, but not a combination of both. See department adviser for more information.

Grade Requirements for the Major

A minimum grade-point average of 2.0 is required for admittance to and graduation from the B.A. or B.S. degree program. Students must receive a grade of C– or better in any course to be counted toward fulfillment of the major requirements. All courses must be taken for a letter grade, with the exception of Cognitive Science 195, 198, and 199, which are taken Pass/No Pass.

Four-Year Plan of Study

The four-year plan of study below assures that all prerequisites and requirements for the cognitive science major are completed. The department does enforce course prerequisites and several courses are offered only once a year,

so careful planning is important. It is recommended that lower-division courses be taken in the first two years, core courses in the third year, and electives in the final year. Check with a departmental adviser about which quarter cognitive science courses will be offered each academic year. Check with a college adviser about course planning to meet college requirements.

FRESHMAN YEAR: Twelve units of math (B.A.) or sixteen units of math (B.S.) chosen from Mathematics 10A-B-C, 20A-B-C-D, 20F, 15A or CSE 20, or 15B or CSE 21
College requirements

SOPHOMORE Cognitive Science 1. Students who officially declared the major and took COGS 17 before fall 2001 do not have to take COGS 1.

JUNIOR YEAR: Nine core courses, chosen from a list of twelve (see *Core Sequences*)

SENIOR YEAR: Electives for the major

Lower-Division Requirements

All majors must complete lower-division courses in introductory cognitive science, calculus, methods, and computer programming:

B.A. Requirements

Twelve units of math (B.A.) chosen from Mathematics 10A-B-C, 20A-B-C-D, 20F, 15A or CSE 20, or 15B or CSE 21. Note: Students should check with the math department for rules governing duplication of credit between the 10 and 20 series.
Cognitive Science 1. Students who officially declared the major and took COGS 17 before fall 2001 do not have to take COGS 1.
Cognitive Science 14
Cognitive Science 18

B.S. Requirements

Sixteen units of math (B.S.) chosen from Mathematics 10A-B-C, 20A-B-C-D, 20F, 15A or CSE 20, or 15B or CSE 21. Note: Students should check with the math department for rules governing duplication of credit between the 10 and 20 series.
Cognitive Science 1. Students who officially declared the major and took COGS 17 before fall 2001 do not have to take COGS 1.
Cognitive Science 14
Cognitive Science 18

Upper-Division Requirements

The B.A. requires completion of twelve upper-division courses, and the B.S. requires fifteen. All majors must complete nine core sequence courses. Students are advised to complete these core courses in their junior year, especially if they intend to apply to the honors program. The remainder of the upper-division requirement is fulfilled by completing electives.

Core Sequences

The B.A. and the B.S. programs require nine core courses total; students must complete all three courses in one core sequence of their choice, and two of the three courses in each of the other three core sequences. Core sequences are:

Cognitive Science 101A-B-C
(Cognitive Theory and Phenomena)

Cognitive Science 102A-B-C
(Distributed Cognition, Everyday Cognition, Cognitive Engineering)

Cognitive Science 107A-B-C
(Cognitive Neuroscience)

Cognitive Science 108D-E-F
(Computational Models of Cognition)

Please note: Students who officially declared the major before fall 2001 may choose to follow the old major requirements or the new major requirements, but not a combination of both. See department adviser for more information.

Electives

At least half of the electives for the major must be taken in the department. Courses in the Cognitive Science 19X series (190A, 190B, 190C, 198, 199) may NOT be used as an elective to satisfy the major requirements for the B.A. degree. One course in the Cognitive Science 19X series may be used as an elective to satisfy the requirements for the B.S. degree, but only with the approval of both the instructor who supervised the course and the undergraduate adviser. A course taken outside the department must meet the following criteria:

1. The course must deal with topics and issues that are clearly part of cognitive science.
2. The material must not be available in a course offered inside the department.

This policy permits students and their advisers to be responsive to changes in course offerings. Majors must obtain departmental approval for electives taken outside of the department.

Areas of Specialization

A major may elect to receive a B.S. in cognitive science with a specified area of specialization. The areas of specialization are intended to provide majors with guidance in choosing elective courses and to make the specific interests and training of a major clear to prospective employers and graduate schools. Specifying an area of specialization is optional; however, students should take into consideration when planning for their specialization that approved courses are not necessarily offered every year.

To major in cognitive science with an area of specialization, the student must fulfill the requirements for the B.S. degree and must choose four of the required six elective courses from a list of approved electives for that area of specialization. (The lists of approved electives for each area of specialization are available in the department office.)

The following areas of specialization are currently offered by the department:

Specialization in Clinical Aspects of Cognition

This area of specialization is intended for majors interested in cognitive neuropsychology, psychiatry, cognitive disorders, and the effects of drugs and brain-damage on cognitive functions. Allowed electives include courses in those topics, as well as organic chemistry, biochemistry, and physiology. Major code: CG31

Specialization in Computation

This area of specialization is intended for majors interested in software engineering or research in computational modeling of cognition. Allowed electives include advanced courses in neural networks, artificial intelligence, and computer science. Students interested in this specialization will most likely select courses from the computer science and engineering course offerings, as courses offered within the cognitive science department are limited. Major code: CG27

Specialization in Human Cognition

This area of specialization is intended for majors whose primary interests include human psychology and applications of cognitive science in design and engineering. Allowed electives

include courses in cognitive development, language, laboratory research of cognition, anthropology, and sociology. Major code: CG28

Specialization in Human Computer Interaction

This area of specialization is intended for majors interested in human computer interaction; Web; visualization; and applications of cognitive science in design and engineering. Additional electives may be petitioned from communication, computer science, computer engineering, and visual arts. Major code: CG30

Specialization in Neuroscience

This area of specialization is intended for majors interested in neuroscience research or medicine. Allowed electives include courses in cognitive neuroscience, organic chemistry, biochemistry, and physiology. Major code: CG29

Cognitive Science Honors Program

The Department of Cognitive Science offers an honors program for a limited number of majors who have demonstrated excellence, talent, and high motivation.

Eligibility Requirements

Students are eligible for admission to the program when they:

1. Complete all core courses
2. Have at least junior level standing
3. Have at least a 3.5 GPA in upper-division major courses and at least a 3.0 overall GPA

Eligible students will enroll in four units of 190A (Pre-Honors Project in Cognitive Science) under a faculty member who has agreed to advise them on a potential honors project. Students may apply the COGS 190A course as an elective toward major requirements whether or not they enter the Honors Program. At the end of the 190A course, students will submit to their faculty mentor a written project proposal. The proposal will define the question to be investigated, survey existing literature, describe the approach and methods that will be used, explain how data will be collected if it is an empirical study, detail how human subjects requirements will be met if necessary, discuss expected results, and provide a timeline for project completion.

Acceptance in Honors Program

To formally enter the Honors Program, students must meet the eligibility requirements above, receive a grade of A– or better in COGS 190A, establish an honors committee of at least two faculty and one graduate student to review the proposal and advise them during the process of completing the honors project, and have their project proposal approved by their honors committee.

The honors committee must be kept informed of any deviations from the original approved project proposal and timeline. Students who fail to make satisfactory progress may be asked to withdraw from the program at any point the adviser or the department chair deems necessary.

Successful completion of the Honors Program requires:

1. Maintenance of a 3.5 GPA in upper-division major courses, and a 3.0 overall GPA
2. Completion of one cognitive science (or related) graduate level course (may be taken P/NP). Students may use the required graduate course as one of their electives for the major whether or not they complete the honors project
3. Completion of COGS 190B and 190C with letter grades of A- or better
4. Completion of COGS 190D (Preparation for Thesis Presentation), a 1-unit seminar given each spring (P/NP)
5. Completion of a written honors thesis describing the project
6. Approval of the thesis by the honors committee and the department chair
7. Satisfactory presentation of the honors thesis to the cognitive science community at the Honors Thesis Presentation Conference, spring quarter.

Students who successfully complete all of the requirements for the Honors Program will graduate *with Distinction in Cognitive Science* recorded on their transcripts.

Minors and Programs of Concentration

Each college has specific requirements, and students should consult with an academic adviser in their provost's office as well as a cognitive science adviser to be sure they fulfill requirements of the college and of the department.

To receive a minor from the Department of Cognitive Science, a student must complete a total of seven (four unit) courses; five of which must be upper-division. Lower-division requirements are normally fulfilled by completing (one of) Cognitive Science 1, 3, 10 or 11 and (one of) Cognitive Science 14, 17 or 18. Upper-division requirements are normally fulfilled by completing two cognitive science electives and one of the following sequences:

Cognitive Science 101A-B-C

Cognitive Science 102A-B-C

Cognitive Science 107A-B-C

Cognitive Science 108D-E-F

All courses must be taken for a letter grade. No grade below C– is acceptable.

Transfer Credit

Students who wish to transfer from another institution to UCSD as cognitive science majors should work closely with university advisers to ensure that all lower-division requirements have been completed and are equivalent to those offered at UCSD. It is extremely important for students to have completed lower-division requirements by the end of their sophomore year so they are prepared for core courses in their junior year. Advanced UCSD students who wish to transfer to the department should consult with the departmental advisers about credit for courses already completed.

Education Abroad

Students majoring in cognitive science are encouraged to participate in the Education Abroad Programs (EAP), and to investigate other options of foreign study through the Opportunities Abroad Program (OAP). By petition, credits earned through EAP/OAP can fulfill UCSD degree and major requirements. Please visit the Web site at http://orpheus.ucsd.edu/icenter/pao for further details. Financial aid is applicable and special study abroad scholarships are readily available.

The Graduate Programs

There are two Ph.D. programs, each with different admissions and graduation requirements. The *Department of Cognitive Science* offers a Ph.D. in cognitive science. Students are admitted to UCSD directly into the department and fulfill degree requirements of the department. The *Interdisciplinary Program in Cognitive Science* offers a joint Ph.D. in cognitive science and a home department (anthropology, communication, computer science and engineering, linguistics,

neurosciences, philosophy, psychology, or sociology). Students are admitted to UCSD through the home department and fulfill the requirements of both the interdisciplinary program and the home department.

Ph.D. in Cognitive Science

This program provides broad training in neurological processes and phenomena; the experimental methods, results, and theories from the study of psychology, language, and social and cultural issues; and the studies of computational mechanisms. The first year is devoted to familiarizing the student with the findings and current problems in cognitive science through courses in foundations and issues.

By the second year, basic courses and laboratory rotations are completed, with the major emphasis on the completion of a year-long research project. Future years are spent completing the advancement to candidacy requirements and doing the thesis research. Throughout the program, there are frequent faculty-student interactions, including special lectures by the faculty or invited speakers and the weekly informal research discussions and cognitive science seminar.

Admissions

The application deadline is January 7. The admissions committee reviews each applicant's statement of purpose, letters of recommendation, GRE scores, previous education and work experience, and grade-point averages, then recommends candidates for admission to the entire faculty, who make the final decision.

Advising

An interim adviser is appointed to serve as general adviser and counselor for each entering student. The adviser helps chart a set of courses that fulfill the content area requirements, taking into account the student's prior training and interests. Students may change the interim adviser at any time (as long as the new interim adviser is willing). At the time of advancement to candidacy, students choose a permanent adviser who also functions as the chair of the dissertation committee.

All entering students are assumed to have basic prerequisite knowledge, and a list of basic readings will be provided to incoming students. Students who do not have this background can acquire it through self-study in the summer preceding arrival at UCSD or by taking self-paced study courses or relevant undergraduate courses at UCSD.

Summary of Requirements

1. Foundations courses
2. Approved study plan, which includes issues courses, methods courses, and laboratory rotations
3. Second-year project
4. Language requirement
5. Advancement to candidacy
6. Teaching
7. Cognitive Science 200 seminar
8. Participation in departmental events and committees
9. Ph.D. dissertation and defense

Description of Requirements

The expectation is that graduate students in the program will maintain a 3.4 GPA, and falling below this expectation may lead to the student being put on departmental probation. No course in which the student is assigned a grade below B– will be allowed to fulfill department requirements.

1. **Foundations Courses (Cognitive Science 201, 202, 203).** Students complete foundations courses in the areas of brain, behavior, and computation by the end of the second year. The department may waive some or all courses for students who already have the required knowledge.
2. **Study Plan.** Students complete a study plan recommended by their adviser. The normal plan includes:
   a. **Issues Courses.** A minimum of six issues courses are required, at least one in each of the areas of brain, behavior, and computation. At least four of the issues courses should be taken within the department. Department recommends completion by the end of the second year. Issues courses taken outside the department require the approval of the adviser in conjunction with the Graduate Committee.
   b. **Methods Courses.** Three methods courses are required, one of which must be an approved statistics course. Students should obtain approval for all three courses from their adviser. An approved list of courses is on file with the department to assist students in selecting courses. Students may petition courses not on the approval list. Such petitions must be approved by the student's adviser and graduate committee. All three courses must be taken for a letter grade.
   c. **Laboratory Rotations (Cognitive Science 290).** A total of three quarters of laboratory rotations in at least two different faculty laboratories are required. Each rotation is for one to two full quarters as required by the faculty laboratory. All rotations should be completed by the end of fall quarter of the second year.

   Students can meet this requirement in the following ways:

   - Three one-quarter rotations in three different laboratories, or
   - One one-quarter rotation and one two-quarter rotation in two different laboratories, or
   - Two two-quarter rotations in two different laboratories for a total of four quarters enrolled in COGS 290.

   Department recommends that student and adviser negotiate a topic and activity, then put the agreement in writing, sign, and give to the graduate coordinator.
3. **Second-Year Research Project (Cognitive Science 210A-B-C and 211A-B-C).** In the summer between the first and second year, students work with their adviser and a faculty committee to develop a prospectus for a research project. The year-long project culminates with written and oral presentations to the faculty at the end of spring quarter. During the second year, concurrent enrollment in Cognitive Science 210A-B-C and Cognitive Science 211A-B-C is required as part of the Second Year Project.
4. **Language Requirement.** The main goal of the language requirement is to give all students firsthand experience with some of the differences in structure and usage of languages and the several issues involved in the

learning of second languages. This requirement can be satisfied by demonstrating satisfactory proficiency, by prior study in a language (e.g., two years of high school study), or by satisfactory completion of one quarter of study in a language course approved by the department.

5. **Advancement to Candidacy/Qualifying Paper and Oral Exam.** There are three components to advancement to candidacy:
   a. Competency. This requirement is met by satisfactorily completing items 1-4 above.
   b. Depth. This requirement is met by satisfactorily completing a talk to the entire department on their thesis topic by the end of the third year. A first draft of the thesis proposal must be submitted to the student's adviser by the end of the third year. Students enroll in COGS 205 during winter and/or spring quarter of the third year.
   c. Dissertation Topic/Advancement Exam. The student prepares a proposal of the dissertation topic that must be approved by the student's doctoral committee. A written proposal is submitted to the committee at least two weeks prior to an oral defense of the proposal. The doctoral committee consists of at least five faculty members: three from the department and two from outside the department; one of the outside members must be tenured.
6. **Teaching (Cognitive Science 500).** All graduate students must serve as a teaching assistant at least one quarter of each academic year in residence. The undergraduate program offers a special challenge to instructor and student alike, and experience with the teaching of that program can provide a valuable part of the education of a cognitive scientist. Teaching assistantships performed in other departments must be approved by formal petition to the graduate committee to count toward the requirement. The department works closely with the Center for Teaching Development to design effective training and development programs for its teaching assistants. At the end of each quarter, instructors prepare written evaluations of all teaching assistants.
7. **Cognitive Science 200 Seminar.** Students must enroll in this seminar for at least three quarters while in residence; frequent participation is encouraged.
8. **Participation in Departmental Events and Committees.** Students participate in departmental special events and committees and serve as student representatives for faculty meetings and the campus-wide Graduate Student Association. Students present their research in the undergraduate SCANS series.
9. **Completion of the Ph.D. Dissertation and Defense.** Candidates prepare a written dissertation demonstrating a substantive contribution to our understanding of cognition. An oral defense follows.

Master's Degree

The Department of Cognitive Science does not offer admissions to a master's program. However, candidates for the Ph.D. who do not hold a master's degree from another institution may be granted the M.S. degree after fulfilling the first three requirements listed above. This is usually at the end of the second year. Duplication of advanced academic degrees, e.g., one at the same level, is not permitted at UCSD. Likewise, a professional degree at the master's or doctoral level, e.g., M.Ed., M.P.I.A., M.D., or Pharm.D., is not regarded as a duplicate of an academic degree.

Evaluation of Performance and Progress

A formal evaluation of performance and progress for all students takes place at the end of spring quarter every year, with special attention given to the first and second years of study and at the time of qualification. The first-year evaluation is based in large part on the performance in foundations and issues courses. The second-year evaluation is based on the student's total performance, with heavy weight given to the student's second-year research project. The third-year evaluation focuses on the competency and depth requirements, and the following years on the progress made toward completion of the dissertation.

Special Events

The department intends to enhance student-faculty interaction and current awareness of active research issues by special "events":

- Lectures by invited speakers or faculty members.
- A full day of faculty/student overview and information at the start of each year, with emphasis on ongoing research activity.
- Presentations of second-year research projects and third-year thesis topics to the entire faculty at the end of each year.
- Final defense of the dissertation accompanied by a public lecture and celebration.

Time Limits to Ph.D.

Students must be advanced to candidacy by the end of spring quarter of their fourth year. Total university support cannot exceed seven years. Total registered time at UCSD cannot exceed eight years.

Financial Aid

Financial support is available to qualified students in the form of fellowships, loans, and assistantships. Students are encouraged to seek fellowships and research awards from outside the university. Please refer to the Graduate Studies section for more information.

The Interdisciplinary Ph.D. Program

FACULTY

Professors

Farrell Ackerman, Ph.D., *Linguistics*
Richard C. Atkinson, Ph.D., *UC President, Emeritus, Cognitive Science and Psychology*
Richard K. Belew, Ph.,D., *Cognitive Science*
Ursula Bellugi, Ph.D., *Adjunct/Psychology*
Geoffrey Bowker, Ph.D., *Communication*
Gregory Brown, Ph.D., *In-Residence, Psychiatry*
Patricia S. Churchland, B.Phil., *Philosophy*
Paul M. Churchland, Ph.D., *Philosophy*
Aaron V. Cicourel, Ph.D., *Emeritus, Cognitive Science and Sociology*
Michael Cole, Ph.D., *Communication*
Garrison W. Cottrell, Ph.D., *Program Director, Computer Science and Engineering*
Eric Courchesne, Ph.D., *Neurosciences*
Karen R. Dobkins, Ph.D., *Psychology*
Jeffrey L. Elman, Ph.D., *Cognitive Science*
Yrjö Engeström, Ph.D., *Communication*
Gilles R. Fauconnier, Ph.D., *Cognitive Science*
Philip M. Groves, Ph.D., *Psychiatry and Neurosciences*

Steven A. Hillyard, Ph.D., *Neurosciences*
James D. Hollan, Ph.D., *Cognitive Science*
Edwin Hutchins, Ph.D., *Cognitive Science*
Edward S. Klima, Ph.D., *Emeritus, Linguistics*
Marta Kutas, Ph.D., *Cognitive Science*
Ronald W. Langacker, Ph.D., *Emeritus, Linguistics*
George Mandler, Ph.D., *Emeritus, Psychology*
Jean M. Mandler, Ph.D., *Emeritus, Cognitive Science*
Hugh B. Mehan, Ph.D., *Sociology*
Donald A. Norman, Ph.D., *Emeritus, Cognitive Science*
Dennis D. M. O'Leary, Ph.D., *Adjunct/ Neurosciences and Biological Sciences*
Carol Padden, Ph.D., *Communication*
Harold E. Pashler, Ph.D., *Psychology*
David M. Perlmutter, Ph.D., *Linguistics*
Maria Polinsky, Ph.D., *Linguistics*
Vilayanur S. Ramachandran, Ph.D., *Psychology*
David P. Salmon, Ph.D., *In-Residence, Neurosciences*
Walter J. Savitch, Ph.D., *Emeritus, Computer Science and Engineering*
Terrence J. Sejnowski, Ph.D., *Biological Sciences—Neurobiology*
Martin I. Sereno, Ph.D., *Cognitive Science*
Larry R. Squire, Ph.D., *In-Residence, Psychiatry, Psychology, and Neurosciences*
Susan Leigh Star, Ph.D., *Communication*
Joan Stiles, Ph.D., *Cognitive Science*
Shirley Strum, Ph.D., *Anthropology*
David A. Swinney, Ph.D., *Psychology*
Doris Trauner, M.D., *Neurosciences and Pediatrics*
David Zipser, Ph.D., *Emeritus, Cognitive Science*

Associate Professors

Gerald J. Balzano, Ph.D., *Music*
Chris Barker, Ph.D., *Linguistics*
John D. Batali, Ph.D., *Cognitive Science*
Charles P. Elkan, Ph.D., *Computer Science and Engineering*
Rick Grush, Ph.D., *Philosophy*
Andrew Kehler, Ph.D., *Linguistics*
David J. Kirsh, D.Phil., *Cognitive Science*
Robert E. Kluender, Ph.D., *Linguistics*
James J. Moore, Ph.D., *Anthropology*
John C. Moore, Ph.D., *Linguistics*
Jaime A. Pineda, Ph.D., *Cognitive Science*

Assistant Professors

Eric Bakovic, Ph.D., *Linguistics*
Serge Belongie, Ph.D., *Computer Science and Engineering*
Andrea A. Chiba, Ph.D., *Cognitive Science*
Seana Coulson, Ph.D., *Cognitive Science*
Gedeon O. Deák, Ph.D., *Cognitive Science*
Virginia de Sa, Ph.D., *Cognitive Science*
Rafael Nuñez, Ph.D., *Cognitive Science*
Katerina Semendeferi, Ph.D., *Anthropology*
Emanuel Todorov, Ph.D., *Cognitive Science*
Jochen Triesch, Ph.D., *Cognitive Science*

The interdisciplinary Ph.D. program is distinct from the departmental Ph.D. program (see previous section) both in admissions and graduation requirements. There are four aspects to graduate study in the interdisciplinary program: (a) a primary specialization in one of the established disciplines of cognitive science; (b) a secondary specialization in a second field of study; (c) familiarity with general issues in the field and the various approaches taken to these issues by scholars in different disciplines; and (d) an original dissertation project of an interdisciplinary character. The degree itself reflects the interdisciplinary nature of the program, being awarded jointly to the student for studies in cognitive science and the home department. Thus, students in linguistics or psychology will have degrees that read "Ph.D. in Linguistics and Cognitive Science" or "Ph.D. in Psychology and Cognitive Science."

Admission to the Program

Students enter UCSD through admission to one of the affiliated departments, which then serves as their home department, and which specifies their primary specialization. The affiliated departments are anthropology, communication, computer science and engineering, linguistics, neurosciences, philosophy, psychology, and sociology. Students may apply for admission to the interdisciplinary program anytime after entering UCSD, typically in the second or third year. Students must have an adviser from their home department who is a member of the interdisciplinary program faculty. If a student does not have such an adviser, a member of the Instructional Advisory Committee will be appointed as interim adviser. The Instructional Advisory Committee is made up of one interdisciplinary program faculty person from each of the home departments. The committee member that will serve as interim adviser for a student will come from the same home department as the student.

Note: Admission to the interdisciplinary Ph.D. program is contingent upon applying to and being accepted in a home department.

Primary Specialization

Primary specialization is accomplished through the home department. Students are expected to maintain good standing within their home departments and to complete all requirements of their home departments through qualification for candidacy for the Ph.D. degree.

Secondary Specialization

The power of an interdisciplinary graduate training program lies in large measure in its ability to provide the student the tools of inquiry of more than one discipline. Students in the cognitive science interdisciplinary program are expected to gain significant expertise in areas of study outside of those covered by their home departments. Such expertise can be defined in several ways. The second area might coincide with that of an established discipline, and study within that discipline would be appropriate. Alternatively, the area could be based upon a substantive issue of cognitive science that spans several of the existing disciplines, and study within several departments would be involved. In either case, students work with their adviser and the Instructional Advisory Committee to develop an individual study plan designed to give them this secondary specialization. A list of courses in cognitive studies at UCSD is available. This requirement takes the equivalent of a full year of study, possibly spread out over several years. Often it is valuable to perform an individual research project sponsored by a faculty member in a department other than the student's home department.

The following list demonstrates some ways to fulfill the secondary specialization requirement. It should be emphasized that these programs are only examples. Students will devise individual plans by working with their advisers and the advisory committee. Ideally, students who elect to do research in their areas of secondary interest will be able to accomplish a substantive piece of work, either one of publishable quality or one that will be of significant assistance in their dissertation projects.

Cognitive Psychology. Get a basic introduction to cognitive psychology through the Cognitive Psychology Seminar (Psychology 218A-B) and acquire or demonstrate knowledge of statistical tools and experimental design (this can be done either by taking the graduate sequence in statistics, Psychology 201A-B, or through the standard "testing out" option offered to all

psychology graduate students). Finally, and, perhaps of most importance, the student should do a year-long project of empirical research in psychology with the guidance of a member of the Department of Psychology.

Cognitive Social Sciences. A course sequence from sociology and anthropology, including one or two courses in field methods and a research project under the direction of a cognitive social sciences faculty member. The course sequence and project should be worked out with the advisory committee to reflect the interests and background of the student. Examples of courses include Distributed Cognition (Cognitive Science 234) and Text and Discourse Analysis (Sociology 204). In addition, courses on field methods are offered by both anthropology and sociology.

Computer Science and Artificial Language. This specialization requires a thorough background in computer science. For those who enter the program without much formal training in this area, the secondary specialization in computer science includes some upper-division undergraduate courses (CSE 100, 102, 105) and a minimum of two graduate courses (CSE 250AB). (Note that these courses require basic knowledge of programming and discrete mathematics areas that may require some additional undergraduate courses for those who lack these skills.) Students with stronger backgrounds in computer science may go straight to graduate courses. For all students interested in this specialization, the course sequences and any projects should be worked out on an individual basis with the student's adviser.

Discourse Structure and Processing. This specialization is highly interdisciplinary, spanning linguistics, computer science, psychology, sociology, philosophy, and anthropology. Research within this specialization depends upon which discipline is given emphasis. Therefore, the specialization will have to be developed according to the interests of the student. All students will have to demonstrate awareness and knowledge of relevant studies and the approaches of the various disciplines.

Linguistics. Students who elect a secondary specialization in linguistics should specialize either in the general area of syntax/semantics or in the general area of phonetics/phonology. Those who specialize in syntax/semantics should plan to take three courses in this area and one course in phonetics/phonology. Conversely, those who specialize in phonetics/phonology should plan to take three courses in this area and one course in syntax/semantics. The specific courses recommended will depend on the individual student's interests and should be arranged in conjunction with the Department of Linguistics faculty liaison to the Cognitive Science Interdisciplinary Program.

In addition, students will prepare a research paper (preferably originating in one of the above courses) that demonstrates control of the methodology and knowledge of important issues in their area of specialization.

Neurosciences. A student specializing in neurosciences would take a program of courses emphasizing brain-behavior relationships, including Behavioral Neuroscience (Neurosciences 264) and the Physiological Basis of Human Information (Neurosciences 243). In addition, depending upon the student's individual interests, one or more of the neurosciences core courses would be taken in the areas of Mammalian Neuroanatomy (Neurosciences 256), Neuropsychopharmacology (Neurosciences 277), and/or Neurochemistry (Neurosciences 234). In most cases, the student would also take a research rotation in the laboratory of a member of the neurosciences faculty.

Philosophy. Students who elect a secondary specialization in philosophy will focus on philosophy of science, philosophy of mind, philosophy of psychology, philosophy of neuroscience, or philosophy of language, depending on their area of primary specialization. Courses suitable for this program include Contemporary Topics in the Philosophy of Language (Philosophy 234), Philosophy of Mind (Philosophy 236), and Seminar on Special Topics (Philosophy 285), which will frequently focus on issues relevant to cognitive science. The course sequence should be worked out with the student's adviser.

Acquisition of Perspective on the Field

The cognitive science faculty offers a special seminar, Cognitive Science 200, that emphasizes the interdisciplinary approach to the field and that covers a variety of different problems, each from the perspective of several disciplines. All students are required to enroll in this seminar a total of six quarters while in residence; most students regularly attend the seminar even after fulfilling the requirement. Students may substitute a Cognitive Science Foundations course for a Cognitive Science 200. A maximum of two quarters may be substituted.

Prequalifying Examinations

Students must complete any prequalifying and field requirements of their home department.

Qualifying Examinations

The Dissertation Advisory Committee. As soon as possible, students form a dissertation committee consisting of:

At least three members from the student's home department, including the student's adviser; and at least three members of the Cognitive Science Program, at least two of whom are not members of the student's home department.

University regulations require that at least one of the faculty members of the committee from outside the home department must be tenured. The committee must be approved by the interdisciplinary program, the home department, and by the dean of Graduate Studies. The dissertation committee is expected to play an active role in supervising the student and to meet with the student at regular intervals to review progress and plans.

In the qualifying examination, the student must demonstrate familiarity with the approaches and findings from several disciplines relevant to the proposed dissertation research and must satisfy the committee of the quality, soundness, originality, and interdisciplinary character of the proposed research.

Interdisciplinary Dissertation

It is expected that the dissertation will draw on both the primary and secondary areas of expertise, combining methodologies and viewpoints from two or more perspectives, and that the dissertation will make a substantive contribution to the field of cognitive science.

Overview

The program can be summarized in this way: In the first years, basic training within the student's primary specialization, provided by the home departments;

In the middle years, acquisition of secondary specialization and participation in the Cognitive Science Seminar;

In the final years, dissertation research on a topic in cognitive science, supervised by faculty from the program.

Time Limits. Time limits for precandidacy, financial support, and registration are those established for the home department. Normative time is six years.

COURSES

LOWER-DIVISION

1. Introduction to Cognitive Science (4)
A team-taught course highlighting development of the field and the broad range of topics covered in the major. Example topics include addiction, analogy, animal cognition, artificial life, brain damage, cognitive development, distributed cognition, human-computer interaction, language, neuroimaging, neural networks, reasoning, robots, and real-world applications.

3. An Introduction to Computing (4)
A practical introduction to computers and how you can use their power. Designed for undergraduates in the social sciences. Topics include: basic operations of personal computers (MAC, PC), UNIX, word processing, email, spreadsheets, and creating web pages using the World Wide Web. *No previous background in computing required. Prerequisites: open to lower-division students only and all HDP majors; all others require department stamps.*

8. Hands-on Computing (4)
Introductory-level course that will give students insight into the fundamental concepts of algorithmic thinking and design. The course will provide the students with first-person, hands-on experience programming a Web crawler and simple physical robots.

10. Cognitive Consequences of Technology (4)
The role of cognition and computation in the development of state-of-the art technologies such as human computational interaction in aviation, air traffic control, medical diagnosis, robotics and telerobotics, and the design and engineering of cognitive artifacts.

11. Introduction to Cognitive Science: Minds and Brains (4)
How damaged and normal brains influence the way humans solve problems, remember or forget, pay attention to things; how they affect our emotions; and the way we use language in daily life.

14. Design and Analysis of Experiments (4)
Design, statistical analysis, and interpretation of experiments in the main areas of cognitive science: brain, behavior, and computation. Introduction to mathematical foundations of probability and statistical decision theory. Decision theory is applied to the problem of designing and analyzing experiments. Students will participate in a group project in which they must design scientific experiments, collect data and analyze results. May fulfill general education requirements; ask a college adviser.

17. Neurobiology of Cognition (4)
Introduction to the organization and functions of the nervous system. Topics include molecular, cellular, developmental, systems, and behavioral neurobiology. Specifically, structure and function of neurons, peripheral and central nervous systems, sensory, motor, and control systems, learning and memory mechanisms. (Students may not receive credit for both Biology 12 and Cognitive Science 17. This course fulfills general-education requirements for Marshall and Roosevelt Colleges as well as Warren by petition.)

18. Introduction to C Programming for Cognitive Modeling (4)
Fundamentals of computer programming are introduced. Topics include: fundamentals of computer architecture, variables, functions, and control structures; writing, testing, and debugging programs; programming style and basic software design. Examples and exercises focus on cognitive science applications. *Prerequisite: Mathematics 10A or 20A.*

25. Introduction to Web Programming (4)
Introduction to Web programming languages and their real-world applications. Concepts and languages covered include document structure (XHTML). A basic background in computing is required, but no prior programming experience.

87. Freshman Seminar (1)
The Freshman Seminar Program is designed to provide new students with the opportunity to explore an intellectual topic with a faculty member in a small seminar setting. Freshman seminars are offered in all campus departments and undergraduate colleges, and topics vary from quarter to quarter. Enrollment is limited to fifteen to twenty students, with preference given to entering freshmen.

91. SCANS Presents (1)
The department faculty and the Students for Cognitive and Neurosciences (SCANS) offer this seminar exploring issues in cognitive science. It includes informal faculty research presentations, investigations of topics not covered in the curriculum, and discussions on graduate school and careers. (May be repeated when topics vary.)

99. Independent Study (2 or 4)
Independent literature or laboratory research by arrangement with and under direction of a Department of Cognitive Science faculty member. *Prerequisites: lower-division standing, completion of thirty units of UCSD undergraduate study, a minimum UCSD GPA of 3.0, and a completed and approved "Special Studies" form.*

UPPER-DIVISION

101A. Sensation and Perception (4)
An introduction to the experimental study of cognition with a focus on sensation and perception. *Prerequisite: Cognitive Science 1.*

101B. Learning, Memory, and Attention (4)
A survey of the experimental study of learning, memory, and attention. Topics include conditioning, automaticity, divided attention, memory systems, and the nature of mental representation. *Prerequisites: Cognitive Science 1. Recommended: Cognitive Science 101A.*

101C. Language (4)
An introduction to structure of natural language, and to the cognitive processes that underline its acquisition, comprehension, and production. This course covers findings from linguistics, computer science, psychology, and cognitive neuroscience to provide an integrated perspective on human language abilities. *Prerequisite: Cognitive Science 1. Recommended: Cognitive Science 101A.*

102A. Distributed Cognition (4)
Distributed cognition extends beyond the boundaries of the person to include the environment, artifacts, social interactions, and culture. Major themes are the study of socially distributed cognition and the role of artifacts in human cognition. *Prerequisite: Cognitive Science 1.*

102B. Cognitive Ethnography (4)
This course examines memory, reasoning, language understanding, learning, and planning directly in everyday, real-world settings. The coursework will include discussions of both the findings and the methodology of naturalistic studies of cognition. *Prerequisite: Cognitive Science 102A.*

102C. Cognitive Engineering (4)
Applications of cognitive science for the design of human-centered systems are explored. An extensive project analyzing an existing system or product or designing a new prototype application is required. *Prerequisites: Cognitive Science 102A and 102B recommended.*

107A. Neuroanatomy and Physiology (4)
This first course in the sequence focuses on principles of brain organization, from neurons to circuits to functional networks. It explores developmental plasticity, neuronal connectivity, cellular communication, complex signaling, and how these various dimensions form functional brain systems. *Prerequisite: Cognitive Science 1.*

107B. Systems Neuroscience (4)
This course is a rigorous introduction to the neurophysiological and neuroanatomical basis of human and animal cognition, covering cellular neurophysiology and circuit modeling, development, visual, somatosensory, auditory, motor, and limbic systems; neuroimaging and language. *Prerequisite: Cognitive Science 107A.*

107C. Cognitive Neuroscience (4)
This course studies brain systems implicated in attention, language, object recognition, and memory. Neurobiological evidence for functional subsystems within these processes and the way specialized systems develop are considered using findings from animal studies, human development, and behavioral and brain imaging. *Prerequisites: Cognitive Science 107B and its prerequisites.*

108D. Programming Methods for Cognitive Science (4)
(Course previously offered as COGS 108A fall 2001)
The design, implementation, and analysis of algorithms and data structures. Applications include: symbolic artificial intelligence, neural networks, genetic algorithms, computer graphics, and human computer interaction. *Prerequisites: Cognitive Science 1 and Cognitive Science 18 or CSE 9A or CSE 10, or permission of instructor.*

108E. Neural Network Models of Cognition I (4)
(Course previously offered as COGS 108B winter 2002)
This course is an elementary introduction to neural networks and their use in cognitive science. Students will learn how to construct and train neural networks to solve problems at both the psychological and neurological levels of cognition. *Prerequisite: Cognitive Science 108D.*

108F. Advanced Programming Methods for Cognitive Science (4)
(Course previously offered as COGS 108C spring 2002) This course focuses on providing students with additional programming experience in the design of cognitive science applications and modeling. Each time it is offered a specific application or modeling area will be covered. *Prerequisites: Cognitive Science 108E and Math 20F.*

113. Cognitive Development (4)
This course examines the foundations and growth of mind, discussing the development of perception, imagery, concept formation, memory, and thinking. Emphasis is placed on the representation of knowledge in infancy and early childhood. (Credit may not be received for both Psychology 136 and Cognitive Science 113.) *Prerequisite: Cognitive Science 101B or Psychology 105 or Psychology 101.* Course not offered in 2004–2005.

115. Neurological Development and Cognitive Change (4)
This course provides an overview of neurological development and explores the relations between physiological change and the experience of the child from the prenatal period through adolescence. *Prerequisite: Cognitive Science 17 or equivalent.*

120. Human Computer Interaction (4)
This course is an introduction to the field of human computer interaction (HCI). It provides an overview of HCI from the perspective of cognitive science. *Prerequisites: Cognitive Science 10 and an introductory programming course, or consent of instructor.*

121. Human Computer Interaction Programming (4)
This course is an introduction to human computer interaction (HCI) programming. It focuses on architectures, implementation techniques, and cognitive issues involved in designing interactive interfaces. *Prerequisite: Cognitive Science 120 or consent of instructor.*

143. Animal Cognition (4)
Review of historical perspectives: introspectionist, behaviorist, and cognitivist models. Examination of how perceptual and motor constraints and ecological demands yield species-specific differences in cognitive repertoire. Contemporary issues in the comparative study of the evolution of human cognition. *Prerequisite: upper-division standing.*

151. Analogy and Conceptual Systems (4)
Human thought and meaning are deeply tied to the capacity for mapping conceptual domains onto each other, inducing common schemas and performing mental simulation. This course examines major aspects of this cognitive activity including metaphor, conceptual blending and embodied cognition. *Prerequisite: upper-division standing.*

154. Communication Disorders in Children and Adults (4)
Neural bases of language use in normal adults, and neural bases of language and communication development in normal children. Evidence on the language and communication deficits in adults (especially aphasia and dementia) and children (specific language impairment, focal brain injury, retardation, and autism). *Prerequisites: upper-division standing.* Course not offered in 2004–2005.

156. Language Development (4)
A comprehensive survey of theory, method and research findings on language development in children ranging from the earliest stages of speech perception and communication at birth to refinements in narrative discourse and conversational fluency through middle childhood and adolescence. *Prerequisites: upper-division standing and background in developmental psychology and/or linguistics is recommended.* Course not offered in 2004–2005.

160. Upper-Division Seminar on Special Topics (1-4)
Special topics in cognitive science are discussed. (May be repeated when topics vary.) *Prerequisite: department approval.*

170. Natural and Artificial Symbolic Representational Systems (4)
This course develops a detailed analogy between the evolution and architecture of language comprehension in human primates and symbol processing at the level of individual cells, contrasting this with the analogy between cognition and computation. *Prerequisites: Cognitive Science 17 or Biology 12; Cognitive Science 18 or Computer Science and Engineering 62AB recommended.*

172. Brain Disorders and Cognition (4)
A review of the patterns of impaired and intact cognitive abilities present in brain-damaged patients in terms of damage to one or more components of a model of normal cognitive functioning. (Cognitive science majors may not receive elective credit for both Psychology 139 and Cognitive Science 172.) *Prerequisite: Cognitive Science 107A.*

174. Drugs: Brain, Mind and Culture (4)
This course explores how drugs interact with the brain/mind and culture. It covers evolutionary and historical perspectives, brain chemistry, pharmacology, expectancies and placebo effects, and models of addiction. It also provides a biopsychosocial survey of commonly used and abused substances. *Prerequisite: upper-division standing.* Midterm, final, paper.

175. The Neuropsychological Basis of Alternate States of Consciousness (4)
This course will review the literature that correlates brain rhythms in the human EEG with aspects of cognition, behavioral states, neuropsycho-pharmacology, and psychopathology in order to understand the psychological and neurophysiological underpinnings of these experiences. *Prerequisites: Cognitive Science 101A or Cognitive Science 107A.*

179. Electrophysiology of Cognition (4)
This course surveys the theory and practice of using recordings of electrical and magnetic activity of the brain to study cognition and behavior. It explores what brain waves reveal about normal and abnormal perception, processing, decision making, memory, preparation, and comprehension. *Prerequisites: Cognitive Science 107A or Psychology 106; Cognitive Science 101A or Psychology 105.*

181. Neural Network Models of Cognition II (4)
This course is a continuation of the study of neural models of cognitive systems with an emphasis on applications and a term-long student project. *Prerequisites: Cognitive Science 108E and its prerequisites.* Course not offered in 2004–2005.

183. Artificial Life (4)
This class will explore models of life as it could be, in artificial as well as biological contexts. An attempt will be made to understand the characteristics which distinguish living from nonliving systems. Coursework includes computer simulations of artificial lifeforms. *Prerequisites: Cognitive Science 18, CSE 5A and 5B, or CSE 11, or equivalent.* Course not offered in 2004–2005.

184. Modeling the Evolution of Cognition (4)
Mathematical and computational modeling of the evolution and mechanisms of simple cognitive functions. Theoretical background, including topics in population genetics, behavioral ecology, evolutionary game theory, dynamical systems theory, genetic algorithms and neural networks will be applied to questions concerning the evolution of behavioral strategies, the relation between evolution and learning, and the evolution of cooperation, communication and other aspects of social behavior. *Prerequisites: Cognitive Science 18, Mathematics 20ABC.*

187A. Cognitive Aspects of Multimedia Design (4)
This course will examine the cognitive basis of successful multimedia designs. We will be interested in what makes an interactive system effective: what makes images easy to understand, animations clear and helpful, and why some sequences of images, text, and sounds make more sense than others. Students will learn Web design, how to evaluate CD ROMs and assess their usability, and gain firsthand experience with the problems of visualization. No programming skills are presupposed but we do assume a strong familiarity with computer software. *Prerequisite: open to cognitive science majors with upper-division standing only.*

187B. Cognitive Aspects of Multimedia Design II (4)
This course follows up on the basics of multimedia design taught in Cognitive Science 187A. Students will probe more deeply into selective topics, such as animation, navigation, graphical display of information, and narrative coherence. A large fraction of time will be spent on group projects. *Prerequisites: COGS 187A; open to cognitive science majors with upper-division standing only.*

188. Representation, Search, and the Web (4)
Computational methods for finding and exploiting structure across vast data corpora, from personal email collections to the entire WWW. Implementation and evaluation of algorithms used as part of modern search engines, and how these are connected to models of shared cognition. *Prerequisites: Cognitive Science 108D or Computer Science and Engineering 12. Recommended: Cognitive Science 108F.*

190A. Pre-Honors Project in Cognitive Science (4)
This independent study course is for advanced students who wish to prepare for and apply to the Cognitive Science Honors Program. After completing this course, students may be admitted to the Honors Program contingent upon significant progress made during the course. (See "Cognitive Science Honors Program" section for more information.) Students should contact faculty whose research interests them to discuss possible projects. *Prerequisite: upper-division standing; instructor and department approval.*

190B. Honors Studies in Cognitive Science (4)
This course will allow cognitive science honors students to explore advanced issues in the field of cognitive science. It will also provide honors students the opportunity to develop an honors thesis on the topic of their choice and begin preliminary work under faculty supervision. Students will receive an "IP" grade in 190B and the grade assigned for 190C, when completed, will replace the "IP" in 190B. *Prerequisites:* Cognitive *Science 190A with grade of A- or better and formal admittance to the Cognitive Science Honors*

Program. (See "Cognitive Science Honors Program" section for more information.)

190C. Honors Thesis in Cognitive Science (4)
This course will provide honors candidates an opportunity to complete the research on and preparation of an honors thesis under close faculty supervision. Oral presentation of student's thesis is required to receive honors; additionally, student must receive grade of A- or better in 190B and 190C to receive honors. *Prerequisite: Cognitive Science 190B with grade of A- or better and formal admittance to the Cognitive Science Honors Program.* (See "Cognitive Science Honors Program" section for more information.)

190D. Preparation for Thesis Presentation (1)
This course is affiliated with the honors program (190A-B-C) and is required of honors students during spring quarter. Its aim is to prepare students to present research results to an audience. Emphasis will be on the oral presentation (organization, wording, graphics), but there will also be some discussion about written research reports. Seminar style format with occasional short lectures wherein students will practice oral presentations and provide constructive criticism to each other. *Prerequisite: must be concurrently enrolled in 190B or 190C.*

191. Laboratory Research (1-4)
Students engage in discussions of reading of recent research in an area designated and directed by the instructor and also participate in design and execution of original research. Assignments include both oral and written presentations and demonstrating the ability to pursue research objectives. *Prerequisites: consent of the instructor and department approval.* (May be repeated for credit, but not to exceed 8 units).

195. Instructional Apprenticeship in Cognitive Science (4)
Students, under the direction of the instructor, lead laboratory or discussion sections, attend lectures, and meet regularly with the instructor to help prepare course materials. Applications must be submitted to and approved by the department. *Prerequisites: upper-division standing; 3.0 GPA; instructor and department approval.* P/NP only.

198. Directed Group Study (4)
This independent study course is for small groups of advanced students who wish to complete a one-quarter reading or research project under the mentorship of a faculty member. Students should contact faculty whose research interests them to discuss possible projects. *Prerequisites: upper-division standing; 2.5 GPA; consent of instructor and department approval.*

199. Special Project (2 or 4)
This independent study course is for individual, advanced students who wish to complete a one-quarter reading or research project under the mentorship of a faculty member. Students should contact faculty whose research interests them to discuss possible projects. *Prerequisites: upper-division standing; 2.5 GPA; consent of instructor and department approval.*

GRADUATE

200. Cognitive Science Seminar (4)
This seminar emphasizes the conceptual basis of cognitive science, including representation, processing mechanisms, language, and the role of interaction among individuals, culture, and the environment. Current developments in each field are considered as they relate to issues in cognitive science. (May be repeated for credit.)

201. Systems Neuroscience (4)
This course is a rigorous introduction to the neurophysiological and neuroanatomical basis of human and animal cognition, covering cellular neurophysiology and circuit modeling; development; visual, somatosensory, auditory, motor, and limbic systems; neuroimaging and language.

202. Cognitive Science Foundations: Computational Modeling of Cognition (4)
This course surveys the development of symbolic and connectionist models of cognition. Selected readings from the late 1940s to the present are covered. Topics include: Turing machines, information theory, computational complexity, search, learning, symbolic artificial intelligence, and neural networks.

203. Cognitive Science Foundations: Theories and Methods in the Study of Cognitive Phenomena (4)
Surveys a variety of theoretical and methodological approaches to the study of human cognition. Topics include language structure, language processing, concepts and categories, knowledge representation, analogy and metaphor, reasoning, planning and action, problem solving, learning and expertise, and emotion.

205. Introduction to Thesis Research (4)
This course is taken to focus the students' development of a thesis topic and research proposal. Students prepare an outline of thesis proposal and make an oral public presentation of the proposed topic prior to the end of the third year. S/U only.

210A-B-C. Introduction to Research (4-4-4)
This sequence is an intensive research project. Students under faculty mentorship perform a thorough analysis of the problem and the literature, carry out original studies, and prepare oral and written presentations. Students should aim for a report of publishable quality. *Letter grade required.*

211A-B-C. Research Methods in Cognitive Science (2-2-2)
Issues in design, implementation, and evaluation of research in cognitive science are discussed. Students will present and comment on their own research projects in progress. Discussions also include presentations of research to various audiences, abstracts, reviews, grant process, and scientific ethics. *Letter grade required.*

213. Issues in Cognitive Development (4)
This course examines current issues in human development of interest to cognitive scientists. An emphasis is placed on the foundations of mind and how information is represented at various stages of learning and development. (May be repeated once, when topics vary.)

215. Neurological and Cognitive Development (3)
This course is presented in two sections. The first part of the course focuses on early neurological development. The second part addresses questions concerned with the relations between cognitive brain development, and linguistic and affective development.

220. Information Visualization (4)
This seminar surveys current research in information visualization with the goal of preparing students to do original research. The focus is on the cognitive aspects of information design, dynamic representations, and computational techniques. Topics vary each time course is offered.

234. Distributed Cognition (4)
This course focuses on aspects of individual and socially distributed cognition. Empirical examples are drawn from natural and experimental settings which presuppose, tacitly or explicitly, socially distributed knowledge among participants. The class examines the way locally managed, pragmatic conditions influence how decisions are framed. Course not offered in 2004–2005.

238. Topics in Cognitive Linguistics (1–4)
(Same as Linguistics 238) Basic concepts, empirical findings, and recent developments in cognitive and functional linguistics. Language viewed dynamically in relation to conceptualization, discourse, meaning construction, and cognitive processing. (As topics vary, may be repeated for credit.) Course not offered in 2004–2005.

241. Ethics and Survival Skills in Academia (3)
(Same as Neurosciences 241) This course will cover ethical issues which arise in academia, including: dishonesty, plagiarism, attribution, sexual misconduct, etc. We will also discuss 'survival' issues, including job hunting, grant preparation, journal reviews, writing letters of recommendation, mentoring, etc.

243. Statistical Inference and Data Analysis (4)
This course provides a rigorous treatment of hypothesis testing, statistical inference, model fitting, and exploratory data analysis techniques used in the cognitive and neural sciences. Students will acquire an understanding of mathematical foundations and hands-on experience in applying these methods using Matlab.

245. Introduction to Probability Theory (4)
This is a one quarter introductory course on probability theory and applications. The target audience is researchers in the cognitive, computational and neural sciences. The course also introduces scientific programming in MatLab. The grade is based on homework, project, or a combination of both. Course not offered in 2004–2005.

250. Connectionist Models of Language (4)
This course covers topics in computational psycholinguistics. The primary focus will be on connectionist models, but will also include work in statistical natural language processing as well as experimental psycholinguistics. Course not offered in 2004–2005.

251. Aphasia (4)
Research and theory on language breakdown in brain-damaged adults is surveyed. Topics include an historical overview from linguistics, psycholinguistics, and neuroscience (especially brain imaging techniques). Credit may not be received for both Psychology 245 and Cognitive Science 251. Course not offered in 2004–2005.

253. Semantics and Cognition (4)
This course explores current issues in the study of meaning and its interaction with other areas of cognitive science. The focus is on cognitive semantics, pragmatics, and meaning construction in general.

254. Pragmatics and Common Sense Reasoning (4)
A study of the pragmatic principles involved in language comprehension and the logic of everyday life. Cognitive, linguistic, cultural, and sociological aspects will be covered.

256. Language Acquisition (4)
Discussion of the acquisition of language by young children, including such topics as its stages, mechanisms, and relation to nonlinguistic development. Course not offered in 2004–2005.

260. Seminar on Special Topics (1-4)
Specific topics in cognitive science are discussed. (May be repeated when topics vary.)

271. Cognitive Neuropharmacology (4)
This course provides a review of the neurochemistry of cognition. Topics include functional anatomy of neurotransmitter circuitry, computational properties of neuromodulation, interaction of psychoactive substances with brain and behavior, neuropharmacological accounts of cognitive disorders (e.g., addiction, depression, schizophrenia). Course not offered in 2004–2005.

272. Topics in Theoretical Neurobiology (4)
The main focus of this course is the relationship between nervous system function and cognition. It covers broad theoretical issues and specific topics. Material comes from lectures, papers, and the text. Topic varies each time the course is offered. (May be repeated for credit.)

273. Biological Basis of Attention (4)
A survey of the research and theories of attention with special emphasis on the current anatomical, physiological, and biochemical basis of attention.

275. Visual Modeling (4)
Visual system neurophysiology and neuroanatomy, and neurally realistic and artificial intelligence modeling approaches are covered. Topics are: dendrites, orientation and edges, motion, stereo, shading and color, eye movements, and pattern recognition. Students prepare computer modeling projects or research papers.

276. Foundations of Neuroimaging (4)
Foundations of neuroimaging: (1) MRI/fMRI: RF excitation, relaxation, echos, image formation, BOLD and flow, DTi, EPI, time and series analysis, (2) cortical surface reconstruction, morphing, mapping, and data display, (3) physiological basis of MEG and EEG, forward and inverse solutions.

279. Electrophysiology of Cognition (4)
This course surveys the theory and practice of using recordings of electrical and magnetic activity of the brain to study cognition and behavior. It explores what brain waves reveal about normal and abnormal perception, processing, decision making, memory, preparation, and comprehension. Graduate students will be required to do additional readings for the material each week (different for each grad) and to present orally (as well as in a written page) a critical analysis of the readings. *Prerequisites: COGS 107A or PSYC 106; COGS 101A or PSYC 105.*

290. Cognitive Science Laboratory Rotation (2)
Laboratory rotations provide students with experience in the various experimental methods used in cognitive science. *Prerequisite: consent of instructor.* S/U only.

291. Laboratory Research (1-4)
Students engage in discussions of reading of recent research in an area designated and directed by the instructor and also participate in the design and execution of original research. Students are expected to demonstrate oral and written competence in presenting original research. *Prerequisite: consent of the instructor and departmental approval.* (May be repeated for credit.)

298. Directed Independent Study (1-12)
Students study and research selected topics under the direction of a member of the faculty.

299. Thesis Research (1-12)
Students are provided directed research on their dissertation topic by faculty advisers.

500. Teaching Apprenticeship (1-4)
This practicum for graduate students provides experience in teaching undergraduate cognitive science courses. S/U only.

Communication

OFFICE: 127 Media Center Communication Building, Marshall College
(858) 534-4410
http://communication.ucsd.edu

Professors

Geoffrey C. Bowker, Ph.D., *Chair*
Michael Cole, Ph.D.
Zeinabu Davis, M.F.A.
Yrjö H. Engeström, Ph.D.
Dee Dee Halleck, *Emeritus*
Daniel C. Hallin, Ph.D.
Robert B. Horwitz, Ph.D.
Carol A. Padden, Ph.D.
Michael S. Schudson, Ph.D.
Susan Leigh Star, Ph.D.

Associate Professors

Lisa Cartwright, Ph.D.
Valerie A. Hartouni, Ph.D., *Academic Senate Distinguished Teaching Award*
Olga A. Vasquez, Ph.D.

Assistant Professors

Akosua Boatema Boateng, Ph.D.
Giovanna Chesler, M.F.A.
Gary Fields, Ph.D.
Brian Goldfarb, Ph.D.
Elana Zilberg, Ph.D.

Associated Faculty

Jane Rhodes, Ph.D., *Associate Professor, Ethnic Studies*

Lecturers with Security of Employment

Claudio Fenner-Lopez, M.A., *Emeritus*
Tom Humphries, Ph.D.

Communication at UCSD is a field of study which emphasizes the role of different technologies of communication, from language, to television, to the Internet, in mediating human experience. It draws from such social science disciplines as anthropology, psychology, sociology, and political science, and from the humanities and fine arts, including theatre, literature, and visual arts. Communication students will develop a critical awareness of the communicative forces which affect their everyday lives.

The communication major is not designed as a training program in advertising, journalism, production, or public relations. It provides students with a solid liberal arts background necessary for graduate studies in communication and other disciplines, and for professional work in a number of communication-related fields, including primary and secondary education.

Though the emphasis of the major is not a technical one, the faculty in the Department of Communication believe that students will develop a deeper understanding of how communication works by exploring firsthand the capabilities and limitations of a variety of media; students, therefore, will have the opportunity to conduct part of their studies in video, writing, theatre performance, or computer communication.

Within the Department of Communication curriculum are three broadly defined areas of study: Communication as a Social Force, Communication and Culture, and Communication and Human Information processing. Students take courses in each of these areas.

Communication as a Social Force

How are social systems affected by communication technology? What is the social organization of the communication industries? How is the information presented by the media related to the characteristics of the intended audiences? How do media fit into the power structure of societies? Courses in this area address such questions. Students analyze mass communications, the development of telecommunication and information technologies, and the political economy of communication institutions both at home and abroad.

Communication and Culture

Film, music, advertising, art, theater, ritual, literature, and language are forms of communication which embody cultural beliefs of the societies

from which they come. These media can influence and bring about changes in social behavior, styles, and traditions. At the same time, individuals and groups can reshape the media. Students will study the social production of cultural objects, the cultural traditions that shape their form and content, and various approaches to interpreting or "reading" television, film, newspapers, language, rituals, and other forms.

Communication and Human Information Processing

How do people turn concepts and ideas into messages? What is the process by which people receive and respond to those messages? Each medium—whether it is language, writing, or electronic media—has different properties that change the way people create and comprehend messages. The impact of television on the individual, the effect of literacy on individuals and on cultures, the ways that concepts are transmitted in film, and the means by which computers expand communication potentials are examples of topics investigated in this area.

The Communication Major

Degree offered: Bachelor of Arts

The major consists of two lower-division courses and fourteen upper-division courses. None of the major courses may be taken on a Pass/No Pass basis.

Lower-Division

*COGN 20: Introduction to Communication
COGN 21: Methods of Media Production

Upper-Division

*COSF 100: Introduction to Communication as a Social Force
*COCU 100: Introduction to Communication and Culture
*COHI 100: Introduction to Communication and Human Information Processing
*COGN 150: Senior Seminar in Communication

One media methods course

Three courses beyond the introductory courses: (one must be chosen from each of the categories: COSF, COCU, and COHI)

Six upper-division communication electives

* These courses must be taken at UCSD.

Note: If students choose to do a 198, 199, or 197 note the following. COGN 198, 199, 197 grading option is Pass/No Pass and only ONE may be applied to the major to satisfy an upper-division elective. AIP 197 must be petitioned for approval for the major.

Residency Requirement

Students are required to complete at least ten classes of their overall work in the major at UCSD. Following are the communication classes required to be taken at UCSD. See your college adviser for further residency requirements.

COGN 20: Introduction to Communication
COGN 21: Methods of Media Production
COSF 100: Introduction to Communication as a Social Force
COCU 100: Introduction to Communication and Culture
COHI 100: Introduction to Communication and Human Information Processing
COGN 150: Senior Seminar
One COCU elective
One COHI elective
One COSF elective
One COMT elective

Requirements for the Communication Minor

(Effective fall 1998)

The communication minor at UCSD is a social science minor. None of the courses may be taken on a Pass/Not Pass basis. Students are required to take seven courses in communication as follows:

*COGN 20 (Introduction to Communication)

Two courses of your choice from the following 100's:
*COSF 100 (Introduction to Communication as a Social Force)
*COCU 100 (Introduction to Communication and Culture)
*COHI 100 (Introduction to Communication and Human Information Processing)
*Four upper-division communication electives within the areas of the chosen 100 classes.

*These courses must be taken at UCSD within the communication department.

Note: COGN 100, COGN 150, 197, 198, and 199 Media Methods, and courses outside of the department may not be used as electives within the minor.

The Honors Program

The Department of Communication offers an honors program to those students who have demonstrated excellence in the communication major. Successful completion of the honors program enables the student to graduate "With Highest Distinction," "With High Distinction," or With Distinction," depending on performance in the program. The honors program requires an application. Students wishing to be considered need to include the following in their application: one faculty adviser who supports their admission to the program, a verified overall GPA of 3.0 and a major GPA of 3.5, and a brief but detailed description of the proposed research or creative project.

Applications will be reviewed by a faculty committee, accepting students who meet this criteria. Students who do not meet this criteria but who have promising projects may be admitted by special dispensation with strong faculty endorsement and a letter of recommendation. Once accepted into the Honors Program, students are required to complete a two-quarter course sequence, COGN 191A/191B in the fall and winter quarters of their senior year. At the end of the fall quarter, students will receive an IP grade report. This grade will change to the final letter grade at the completion of the course sequence in the winter quarter. This grade is based on attendance in the seminars and successful completion of the research paper or creative production.

The Graduate Program

The Department of Communication offers a program of study leading to the Doctor of Philosophy degree. Communication at UCSD seeks to combine modes of analysis from the humanities and social sciences to explore the history, structure, and process of communication. The graduate program is conceived as a blending of the tradition of critical communication research with the empirical tradition of American scholarship. The program does not closely resemble any other communication department in this country. It is related by sympathy and interest to mass communication programs, but not by kinship. Historically, this department grew out of an interdisciplinary program jointly sponsored by the Departments of

Drama (currently, Theatre and Dance), Political Science, Psychology, and Sociology. The department retains strong ties to the departments and disciplines from which it developed.

The study of communication at UCSD places major emphasis on historical and comparative approaches to symbolically mediated human activity. The graduate curriculum is organized around three perspectives: 1. Communication as a Social Force, 2. Communication and Culture, and 3. Communication and the Individual. Communication as a Social Force deals with the history and political economy of mediated communication and the study of the media as social institutions. The department is particularly strong in the areas of telecommunications, regulation, and information studies. Special interests include the increasing importance of information and information technologies in American society and the global consequences of media practices. Communication and Culture involves the analysis of culture, using traditions from literature, folklore, history, sociology, and anthropology to focus on the social construction of interpretation and meaning. Special interests include the study of broadcast news, print journalism, commercial entertainment, and live performances as communicative systems. The department is particularly strong in the areas of popular culture, political culture, and the relationship of nature to culture. Communication and the individual involves examination of the individual as socially constituted through language and other media. Special interests include computer-mediated interaction, the effects of specified media practices on individual consciousness, and the language and culture of the deaf community. The program also emphasizes a production component in which students test theory in practical implementations. Some faculty and student interests bridge the components of the curriculum. Faculty research interests that do so include concepts of person and mind, communication and collective memory; relations of language, power and culture; gender and cultural forms; telecommunications and information studies and communication and technology in the work place.

Ph.D. Requirements

1. 200A-B-C (Introduction to the Theory of Communication as a Social Force, Communication and Culture, and Communication and the Individual).
2. 294, The History of Communication Research.
3. At least three methods courses from the 201 sequence (see course listings).
4. Four courses in communication history and theory (see course listings).
5. 280, Advanced Workshop in Communication Media.
6. 296, Communication Research as an Interdisciplinary Activity.
7. First-Year Exam and Evaluation: At the end of the spring quarter of the student's first year, the student must pass a comprehensive written examination based on course work completed during the first year.
8. Language Requirement: All students are required to demonstrate proficiency in one language other than their native language.
9. Qualifying Examinations: Before the end of the fourth year the student must take and pass an oral qualifying examination. The exam will be based on two papers concerning two of the subfields covered in the program. The student will also present a separate dissertation proposal at the examination. At this time, the faculty will examine the proposal for appropriateness and feasibility.
10. Teaching Requirement: In order to acquire teaching experience, all students are required to participate in the teaching activities of the university for three academic quarters.
11. Dissertation: Acceptance of the dissertation by the university librarian represents the final step in completing all requirements for a Ph.D. The dissertation committee must be approved by the department chair and the dean of Graduate Studies.

Departmental Ph.D. Time Limit Policies

Students must be advanced to candidacy by the end of four years. Total university support cannot exceed seven years. Total registered time at UCSD cannot exceed eight years.

Student Advising

Faculty Graduate Adviser:
Lisa Cartwright, Ph.D.

Faculty Undergraduate Adviser:
Valerie Hartouni, Ph.D.

Undergraduate Student Affairs Advisers:
Bea Velasco
Jamie Lloyd

Graduate Coordinator:
Gayle Aruta

COURSES

LOWER-DIVISION

General Communication

COGN 20. Introduction to Communication (4)
An historical introduction to the development of the means of human communication, from language and early symbols through the introduction of writing, printing, and electronic media, to today's digital and multimedia revolution. Examines the effect of communications media on human activity, and the historical forces that shape their development and use. Offered fall and spring quarters.

COGN 21. Methods of Media Production (4)
This course explores fundamental technical and social constraints shaping media production: light, optics, electricity, news media technology, camera techniques, basic editing languages, and aesthetic standards affecting production decisions. Satisfactory completion of COGN 21 is required to obtain a "media card." Offered winter and spring quarters.

UPPER-DIVISION

Communication as a Social Force

COSF 100. Introduction to Communication as a Social Force (4)
A critical overview of areas of macro communication and analysis, with special emphasis on the development of communication institutions, including broadcasting, common carriers, and information industries. Questions regarding power, ideology, and the public interest are addressed. *Prerequisite: COGN 20.* Offered fall quarter.

COSF 123. Communication, Dissent, and Social Movements (4)
Emergence of dissent in different societies, and the relationship of dissent to movements of protest and social change. Movements studied include media concentration, antiwar, antiglobalization, death penalty, national liberation, and labor. Survey of dissenting voices from Tolstoy and Naomi Klein seeking to explain the relationship of ideas to collective action and its outcomes. *Prerequisite: COSF 100 or consent of instructor.*

COSF 125A-B. Civic Participation (4)
What are the sources of political apathy and political engagement? What are the variety of ways Americans express civic involvement and political concern? Primary focus will be on the contemporary United States, but with substantial attention to comparative and historical perspectives. COSF 125B is a continuation of COSF 125A. This will be run as a research seminar. Students will write library-based or fieldwork-based empirical research papers of 25-40 pages. *Prerequisites: COSF 100 or consent of instructor for COSF 125A. COSF 125A and instructor consent for COSF 125B.*

COSF 126. The Information Age in Fact and Fiction (4)
Analysis of the forces propelling the "Information Age." An examination of the differential benefits and costs, and a discussion of the presentation in the general media of the "Information Age." *Prerequisite: COSF 100 or consent of instructor.*

COSF 127. The Internet Industry (4)
The political economy of the emergent Internet industry, charted through analysis of its hardware, software, and services components. The course specifies leading trends and changing institutional outcomes by relating the Internet industry to the adjoining media, telecommunications, and computer industries. *Prerequisite: COSF 100 or consent of instructor.*

COSF 134. Communication, Politics, and Citizenship in America (4)
(Formerly COCU 134.) Selected topics, both historical and contemporary, on the public sphere, political participation, and the meaning of citizenship. Topics may include: voting practices, the role of political parties, social and cultural dimensions of citizenship, and shifts in public understanding of what counts as "political." The course may require five to ten hours of internship work, arranged through the AIP office. See instructor for further information. *Prerequisite: COSF 100 or consent of instructor.*

COSF 139A-B. Law, Communication, and Freedom of Expression (4-4)
An examination of the legal framework of the freedom of expression in the United States. 139A covers the fundamentals of First Amendment law through the consideration of key cases in historical context. Prior restraint, incitement, obscenity, libel, fighting words, public forum, commercial speech, and hate speech are some of the topics covered. 139B focuses on the law of mass communication, examining the different legal treatments accorded print, broadcasting, cable, and common carriers. The decline of broadcast regulation, the breakup of AT&T, the rise of new forms of mass communication, and the question of the public interest are of central concern. *Prerequisites: 139A-COSF 100 or PS 40 or consent of instructor. 139B-COSF 100 or PS 40, COSF 139A preferred.*

COSF 140B. Comparative Media Systems: Europe (4)
The development of media systems and policies in Europe. Differences between European and American journalism. Debates over the commercialization of television. The role of media in post-communist societies in Eastern Europe. *Prerequisite: COSF 100 or consent of instructor.*

COSF 140C. Comparative Media Systems: Latin America and the Caribbean (4)
The development of media systems and policies in Latin America and the Caribbean. Debates over dependency and cultural imperialism. The news media and the process of democratization. Development of the regional television industry. *Prerequisite: COSF 100 or consent of instructor.*

COSF 14CXL. Foreign Language Discussion (1)
Students will exercise advanced foreign language skills to discuss materials and the correspondingly numbered communication language foreign area course. This section is taught by the course instructor, has no final exam, and does not affect the grade in the core course, COSF 140C. *Prerequisite: concurrent enrollment in COSF 140C.*

COSF 141. History of U.S. Telecommunications (4)
This course provides a sustained historical focus on the developing social form and industry structure of U.S. telecommunications, beginning with the Post Office. Policy issues are regularly incorporated into readings and discussions. Emphasis is placed on the emergence, around the turn of the century, of the regulated, national telephone network system dominated by AT&T and its extension. *Prerequisite: COSF 100 or consent of instructor.*

COSF 145. Communication and Development in China (4)
Communication is playing an increasingly important role in the political, economic, and social transformations in China. This course explores the interconnections between communication and China's pursuit of a specific mode of development in the context of globalization. Theoretical discussions will be combined with concrete analysis of media products and the changing structure of Chinese communication industries. *Prerequisite: COSF 100 or consent of instructor.*

COSF 159. Work and Industry in the New Information Economy (4)
This course, a research seminar, examines the evolution of the so-called new information economy and analyzes the transformation of patterns of work and industrial organization. Students will be expected to write a research paper, typically on some aspect of the new economy in the San Diego-Tijuana region. *Prerequisite: upper-division standing or consent of instructor.*

COSF 160. Political Economy/Global Consumer Culture (4)
This course critically examines social and economic forces that shape the making of this new global consumer culture by following the flows of consumption and production between the 'developed' and 'developing' worlds in the 1990s. We will consider how consumers, workers, and citizens participate in a new globalized consumer culture that challenges older distinctions between the 'First' and the 'Third World.' In this course, we will focus on the flows between the U.S., Asia, Latin America. *Prerequisite: COSF 100 or consent of instructor.*

COSF 167. Emerging Global High-Tech Regions: Labor and National Development (4)
This course will pose critical questions about the nature of work, the role of labor unions, and national development goals in high-tech regions in the 1980s, 1990s. Case studies will consist of a number of common issues in the following regions from Silicon Valley to Asia, Europe, and Latin America: How do these regions fit in the overall development goals of different national economies? What terms of work predominate in the global 'information economy'? What is, and can be the role of the organized labor within and across national borders? What are the implications for labor rights? *Prerequisite: upper-division standing or consent of instructor.*

COSF 171A. American News Media (4)
(Same as Soc 165A.) History, politics, social organization, and ideology of the American news media. SF 171A surveys the development of the news media as an institution, from earliest new newspapers to modern mass news media. SF 171B deals with special topics, including the nature of television news, and with methods of news media research, and requires a research paper. *Prerequisite: COSF 100 for COSF 171A; COSF 171A is required for COSF 171B.*

COSF 175. Advanced Topics in Communication: Social Force (4)
Specialized study in communication as a social force with topics to be determined by the instructor for any given quarter. Past topics include information as a commodity and book publishing. May be repeated for credit three times. *Prerequisite: COSF 100 or consent of instructor.*

COSF 180. Political Economy of Mass Communications (4)
The social, legal, and economic forces affecting the evolution of mass communications institutions and structure in the industrialized world. The character and the dynamics of mass communications in the United States today. *Prerequisite: COSF 100 or consent of instructor.*

COSF 181. Political Economy of International Communications (4)
The character and forms of international communications. Emerging structures of international communications. The United States as the foremost international communicator. Differential impacts of the free flow of information and the unequal roles and needs of developed and developing economies in international communications. *Prerequisite: COSF 100 or consent of instructor.*

COSF 183. The Politics of World Music (4)
What is "world music?" How, where, and why did it come into being? Is it a naturally occurring category of music? What makes it distinct from other music? We critically examine history of world music, analyzing how it is produced, circulated, and consumed. *Prerequisite: COSF 100 or consent of instructor.*

COSF 184. The Mass Media and Politics in Africa (4)
This course will critically examine the role of the mass media in Sub-Saharan Africa in the areas of colonial rule, nationalist struggles, authoritarianism, and popular movements. It will examine general trends regionally and internationally, as well as individual national cases, from the early twentieth century to the Internet news services of the information age.

COSF 185. Gender, Labor, and Culture in the Global Economy (4)
Course examines the ways in which women participate in the global economy as the producers of consumer products and of cultural goods like entertainment and information. It also examines power as it relates to women's labor in producing such material and cultural goods. *Prerequisite: COSF 100 or consent of instructor.*

COSF 186. Film Industry (4)
A study of the social organization of the film industry throughout its history, addressing such questions as who makes films, by what criteria, and for what audience. The changing relationships between studios, producers, directors, writers, actors, editors, censors, distributors, audience, and subject matter of the films will be explored. *Prerequisite: COSF 100 or consent of instructor.*

Communication and Culture

COCU 100. Introduction to Communication and Culture (4)
Processes of communication shape and are shaped by the cultures within which they occur. This course emphasizes the ways in which cultural understandings are constructed and transmitted via the variety of communication media available to members. A wide range of cultural contexts are sampled, and the different ways that available communication technologies

(language, writing, electronic media) influence the cultural organization of people's lives are analyzed. *Prerequisite: COGN 20, or HDP 1, or consent of instructor. Offered winter quarter.*

COCU 110. Cinema in Latin America (4)
Analysis of the changing content and sociopolitical role in Latin America of contemporary media, including the "new cinema" movement, recent developments in film, and popular television programming, including the telenovela. Examples drawn from Mexico, Brazil, Cuba, and other countries. *Prerequisite: COCU 100 or consent of instructor.*

COCU 110XL. Foreign Language Discussion (1)
Students will exercise advanced foreign language skills to discuss materials and the correspondingly numbered communication language foreign area course. This section is taught by the course instructor, has no final exam and does not affect the grade in the core course, COCU 110. Concurrent enrollment in COCU 110 required.

COCU 120. The Problem of Voice (4)
This course will explore the problem of self-expression for members of various ethnic and cultural groups. Of special interest is how writers find ways of describing themselves in the face of others' sometimes overwhelming predilection to describe them. *Prerequisite: COCU 100 or consent of the instructor.*

COCU 123. Black Women Filmmakers (4)
Students examine film and video media produced by black women filmmakers worldwide. This course will use readings from the writings of the filmmakers themselves as well as from film studies, women's studies, literature, sociology, and history. *Prerequisite: COCU 100 or consent of the instructor.*

COCU 124. Documentary History and Theory (4)
Lecture and discussion course in the history of nonfiction film and video. Through film and written texts we survey the nonfiction film genre, considering technological innovations, ethical issues, and formal movements related to these representations of the "real." Students write a research paper in lieu of a final. *Prerequisite: COCU 100 or consent of instructor.*

COCU 125. How to Read a Film (4)
The purpose of this course is to increase our awareness of the ways we commonly interpret or make understandings from movies and to enrich and increase the means by which one can enjoy and comprehend movies. We will talk about movies and we will explore a range of methods and approaches to film interpretation. Readings will emphasize major and diverse theorists, including: Bazin, Eisenstein, Cavell, and Mulvey. *Prerequisite: COCU 100 or consent of instructor.*

COCU 127. Folklore and Communication (4)
Folklore is an important variety of noncommercial communication in societies dominated by commercial media. A source of alternative understandings, folklore is characterized by particular styles, forms, and settings. This course introduces a wide range of folklore genres from different cultures and historical periods, including oral narrative, material folk arts, dramas, and rituals. We will pay special attention to the relation between expressive form and social context. Sources include folklore texts, ethnographies, performances on film and videotape, novels, autobiographies, and student observations and experiences. *Prerequisite: COCU 100 or consent of the instructor.*

COCU 128. Folklore and Mass Media (4)
Local personal, vernacular, and oral traditions coexist with and influence the mass-produced, mass-mediated culture of the late twentieth century. This course examines the history of this influence, using materials such as oral histories, life stories, urban legends, and soap operas to explore the conjunctions of folklore and commercially produced entertainments in everyday social life. *Prerequisite: COCU 100 or consent of the instructor.*

COCU 130. Tourism: Global Industry and Cultural Form (4)
The largest industry in the world has far-reaching cultural ramifications. We will explore tourism's history and its contemporary cultural effects, taking the perspective of the "toured" as well as that of the tourist. *Prerequisite: COCU 100 or consent of the instructor.*

COCU 132. Gender and Media (4)
This course examines the work of women artists and the history of the representation of women in the media, from the beginnings of cinema to the present, and offers a basic introduction to feminist media theory. It focuses on the representation of gender, and narrative and experimental strategies used by women media makers, and the role of the female spectator. *Prerequisite: COCU 100 or consent of the instructor.*

COCU 135. Public Relations in Society (4)
Using modules, this course introduces students to public relations and allows them to analyze its place in our increasingly complex society. The three modules are designed and structured to go from an understanding of what public relations is to allowing you the opportunity to identify and analyze its role in society. *Prerequisite: COCU 100 or consent of the instructor.*

COCU 136. Concepts of Freedom (4)
This course examines some of the changing cultural, social, technological, and political meanings, practices, and aspirations that together constitute what is, and has been, called Freedom. *Prerequisite: COCU 100 or consent of the instructor.*

COCU 137. The Politics of Bodies (4)
This course will explore the construction of gendered bodies and gendered sexuality in the late twentieth century, postindustrial culture(s). Through the use of fiction, film and theory as well as political, historical and media analysis, we will examine the contested terrain, including the race and class coding, of such issues as abortion, infertility, eating disorders, gender identity, and AIDS. *Prerequisite: COCU 100 or Women's Studies 2A, B, or C.*

COCU 138. Feminist Theory (4)
This class is designed to initiate students into the pleasures, pains, and perplexities of critical thinking about gender. We will survey a wide variety of thinkers and issues, consider some of the historical as well as contemporary debates within western feminist thought, and develop tools of analysis for future work. *Prerequisite: upper-division standing. Recommended: Women's Studies/Cultural Traditions 2A, B, or C.*

COCU 139. Reproductive Discourse and Gender (4)
In this course we will examine as a problem of discourse and culture the controversies surrounding the development and use of the new technologies of human genetics and reproduction. Of particular interest will be the way in which these new technological practices and processes test, erode, or undermine traditional understanding of "human nature" and relationship while enforcing traditional understanding of gender. *Prerequisite: COCU 137 or Women's Studies 2A, B, or C.*

COCU 140. Television, Culture, and the Public (4)
How and what does television communicate? Emphasis will be on contemporary U.S. television programming, placed in comparative and historical context. Special topics may include: TV genres; TV and politics; TV and other media. Frequent in-class screenings. *Prerequisite: COGN 20 or consent of the instructor.*

COCU 141A. Media and Technology: Global Nature, Global Culture (4)
Considers globalization's impact on concepts of nature in and through media texts, information systems, circulation of consumer goods and services, the emergence of global brands, science, health initiatives, environmental media activism, technology transfer in the twentieth and early twenty-first centuries. *Prerequisite: COSF 100 or COCU 100 or COHI 100 or consent of instructor.*

COCU 141B. Media and Technology: Gender and Biomedicine (4)
From historical and cultural aspects of media, information, imaging technology use in biomedical research, clinical care, health communication to constructions of gender, and identity. We approach the subject through audiovisual texts and writings from fields including science and technology studies and cultural studies. *Prerequisite: COSF 100 or COCU 100 or COHI 100 or consent of instructor.*

COCU 141C. Media and Technology: Disability (4)
Cultural and historical ways of defining and understanding disability relative to communication and assistive technologies, including the impact of digital technologies and the Americans with Disabilities Act. Use of audiovisual texts and writings from fields including science and technology studies, and cultural studies. *Prerequisite: COSF 100 or COCU 100 or COHI 100 or consent of instructor.*

COCU 142. Holocaust Discourse (4)
Legal, visual, historical, cultural discourses and debates that contribute to represent the Holocaust as a coherent and cohesive event, and as a touchstone of moral and political discourse in the U.S., entailing powerful stories about pluralism, tolerance, democracy, human rights, and justice. *Prerequisite: COCU 100 or consent of instructor.*

COCU 148. Communication and the Environment (4)
Survey of the communication practices found in environment controversies. The sociological aspects of environmental issues will provide background for the investigation of environmental disputes in particular contested areas, such as scientific institutions, communities, work-places, governments, popular culture, and the media. *Prerequisite: COCU 100 or consent of instructor.*

COCU 149. Youth, Culture and Media (4)
The interrelationship of youth and modern media in the "American century," youth culture and how it is closely tied to various media, the 60s growth of rock culture and mass media's ambivalence toward the young as social threats, and as a lucrative market for pop products. Other topics include: violence, sex and gender relations, ethnic subcultures, activism, advertising, video games, and the Internet. *Prerequisite: COCU 100 or consent of instructor.*

COCU 161. Material Culture: Design and Social Process (4)
An investigation of the connections between material culture and the technical and social forces affecting its production and use. Analytic topics include dress, gardening, and urban planning. *Prerequisite: COGN 20 or consent of instructor.*

COCU 162. Popular Culture (4)
An overview of the historical development of popular culture from the early modern period to the present. Also a review of major theories explaining how popular culture reflects and/or affects patterns of social behavior. *Prerequisite: COGN 20 and COCU 100 or consent of instructor.*

COCU 163. Popular Culture in Contemporary Life (4)
Treats the products of the modern culture industries and theories of their social and political importance. We will look at a wide range of cultural forms, including music, television, fashion, food, and landscapes. Special attention will be paid to questions of how popular culture is consumed, what it means to its audiences, and to gender, racial and ethnic differences among producers and consumers. *Prerequisite: upper-division standing.*

COCU 165. History, Memory and Popular Culture (4)
What role does popular culture play in shaping and creating our shared memory of the past? The course examines diverse sources such as school text books, monuments, holidays and commemorations, museums, films, music, and tourist attractions. *Prerequisite: COCU 100 or consent of the instructor.*

COCU 166. Cartoons (4)
This class relates cartoon programming for children to the history of western childhood and the contemporary American culture of the child. While other classes may deal with the effects of television on children, this one is designed to encourage students to review the long-standing western traditions of hope and fear associated with children that shape these concerns. *Prerequisites: COGN 20 and COCU 100 or consent of the instructor.*

COCU 170. Advertising and Society (4)
Advertising in historical and cross-cultural perspectives. Topics will include the ideology and organization of the advertising industry; the meaning of material goods and gifts in capitalist, socialist, and nonindustrial societies; the natures of needs and desires and whether advertising creates needs and desires; and approaches to decoding the messages of advertising. *Prerequisite: COCU 100 or consent of instructor.*

COCU 175. Advanced Topics in Communication: Culture (4)
Specialized study in communication and culture with topics to be determined by the instructor for any given quarter. Past topics include critical theory, rituals and spectacles. May be repeated for credit three times. *Prerequisite: COCU 100 or consent of instructor.*

COCU 179. Colonialism and Culture (4)
This course examines colonial narratives, slave accounts, essays, and stories by both colonizers and colonized. It also explores the issue of nationalism in determining the limits of colonialism among minority groups in the United States and in the Third World. *Prerequisite: upper-division standing.*

Communication and Human Information Processing

COHI 100. Introduction to Communication and the Individual (4)
An introduction to theories of human mental processes which emphasizes the central role of mediation. The course covers methods of research that permit the study of mind in relation to different media and contexts of use. The traditional notion of media effects is critically examined in a number of important domains, including television, film, writing, and oral language. *Prerequisite: COGN 20 or HDP 1, or consent of instructor.* Offered spring quarter.

COHI 108. The Development of Communication in Children (4)
(Same as HDP 130.) The course serves as an introduction to research methods in the study of child development. The special focus of the course will be on how children acquire competence in symbolic communication, including language, drawing, writing, and number systems. Observation of children in their interactions with each others and adults will be required. *Prerequisite: COHI 100 or HDP 1.*

COHI 114. Bilingual Communication (4)
This course is designed to introduce students to the multiple settings in which bilingualism is the mode of communication. Students will examine how such settings are socially constructed and culturally-based. Readings on language policy, bilingual education, and linguistic minorities, as well as field activities will constitute the bulk of the course. *Prerequisite: COHI 100 or consent of instructor.*

COHI 115. Education and Global Citizenship (4)
The course introduces students to concepts, possibilities, and dilemmas inherent in the notion of global citizenship. Students will formulate goals and instructional strategies for global education and the expected competence of an individual within a global society—able to focus simultaneously upon many diverse elements, issues, and contexts. It will examine the role that communication and curriculum can play in the formation of identity, language use, and civic responsibility of a global citizen. *Prerequisite: COHI 100 or consent of instructor.*

COHI 117. Language, Thought, and the Media (4)
This course examines the ways in which various communicative channels mediate human action and thought. A basic premise of the course is that human thought is shaped in important ways by the communicative devices used to communicate. There is a particular emphasis on how thought develops, both historically and in the individual. *Prerequisite: COHI 100 or consent of instructor.*

COHI 119. Learning to Read (4)
This course explores learning to read as a process involving individual, cultural, and social resources. Reading difficulty is understood as induced by lack of resources, such as access to books or access to strategies for decoding, comprehension, and analysis of written text. Activities of reading are taken as a basic context for understanding patterns of chronic and pervasive reading difficulty in their populations. *Prerequisite: COHI 100 or consent of instructor.*

COHI 120. Reading the Web (4)
This course explores how networked computing has helped change many aspects of modern life, from how we manage illness to how we see ourselves culturally. The focus of the class is the online venue—how has the Web become part of daily life? What is different about goods, services, and events that transpire online? What theories of communication and social interaction are useful in understanding online behavior? *Prerequisite: COHI 100 or consent of instructor.*

COHI 121. Literacy, Social Organization, and the Individual (4)
This course will examine the historical growth of literacy from its earliest precursors in the Near East. The interrelation between literate technology and social organization and the impact of literacy on the individual will be twin foci of the course. Arriving at the modern era, the course will examine such questions as the impediments to teaching reading and writing skills to all normal children in technological societies and the relation between literacy and national development in the Third World. *Prerequisite: COHI 100 or COCU 100 or HDP 1 or consent of instructor.*

COHI 123. Children and Media (4)
A course which analyzes the influence of media on children's lives. The course adopts an historical as well as social perspective on childhood within which media plays a role. Among media studied are books, films for children, video games, computer games, and television. *Prerequisite: COGN 20 or HDP 1 or consent of instructor.*

COHI 124. Voice: Deaf People in America (4)
The relationship between small groups and dominant culture is studied by exploring the world of deaf people who have for the past twenty years begun to speak as a cultural group. Issues of language, communication, self-representation, and social structure are examined. *Prerequisite: COHI 100 or consent of instructor.*

COHI 125. Communication in Organizations (4)
Organizations are analyzed as historically-evolving discursive systems of activity mediated by talk, text, and artifacts. The class covers sense making, coordinating, symbolizing, talking, negotiating, reading and writing, story-telling, joking, and visualizing in organizations. Exemplary case studies, employing several complementary theoretical frameworks, are used to analyze these communicative processes. *Prerequisite: COHI 100 or consent of instructor.*

COHI 126. Toys and the Material Life of Children (4)
This course reviews a history of toys and those used by children. Toys will be studied from the view of their imagery and market popularity, including dolls, action figures, blocks, trains, cars, computer games, and "educational toys." Students will analyze the toy industry and its impact on childhood, leisure, and family life. *Prerequisite: COHI 100 or consent of instructor.*

COHI 127. Biography and Life Stories (4)
Course examines several different ways of telling stories as a form of communication: our own life and about the lives of others. There are also the occasions that the life stories of ordinary people are told at and celebrated: for example, funerals, festschrifts, retirement dinners, fiftieth-anniversary parties, and retrospective art shows. *Prerequisite: COHI 100 or consent of instructor.*

COHI 129. Borderlands (4)
Communicative and identity aspects of "marginality"—belonging to more than one race, community, or nationality, and on the literature about insiders and outsiders. Considers contemporary race-critical and feminist theory, including cyborg anthropology, the

historical concept of race in America, and the problematics of multiple memberships of various sorts. *Prerequisite: COHI 100 or content of instructor.*

COHI 134. Language and Human Communication (4)
This course looks at the interaction of technology, culture, and language, with a focus on narrative styles. Theories on the role of technology in shaping and transforming talk are examined. Cultural properties such as physical space and work traditions are studied as they bear on styles of talking and talking about the world. Storytelling, humor, and talk of children are used as examples of styles of talking. *Prerequisite: COHI 100 or consent of instructor.*

COHI 135. Language and Globalization (4)
The interaction of language and culture in human communication. New and old languages, standard and dialect, dominant and endangered, are the special focus. Selected languages as examples of how languages exist in contemporary contexts. *Prerequisite: COHI 100 or consent of instructor.*

COHI 143. The Psychology of the Filmic Text (4)
The course will examine a variety of films using different perspectives and methods of psychology to analyze the types of problems raised by the nature of cinematic communication. Topics will include an introduction to basic elements of cinematography, theoretical and technical bases of film's "grammar," perception of moving pictures, the function and status of sound, the influence of film on behavior and culture (and vice versa), the representation of psychological and social interaction, the communication of narrative and spatial information formation, the generation and translation of film's conventions, and the parameters which the medium and the culture impose upon the attempt to express various forms of abstraction in the concrete visual language of film. *Prerequisite: COHI 100 or consent of instructor.*

COHI 175. Advanced Topics in Communication: Human Information Processing (4)
Specialized study in communication: human information processing with topics to be determined by the instructor for any given quarter. May be repeated for credit three times. *Prerequisite: COHI 100 or consent of the instructor.*

Communication Media Methods

COMT 100. Nonlinear/Digital Editing (4)
Prepare students to edit on nonlinear editing facilities and introduce aesthetic theories of editing: time code editing, time line editing on the Media 100, digital storage and digitization of audio and video, compression, resolution, and draft mode editing. *Prerequisites: communication majors, COGN 21.*

COMT 101. Television Analysis and Production (6)
An introduction to the techniques and conventions common to the production of news, discussion, and variety-format television programs. Particular emphasis will be placed on the choice of camera "point of view" and its influence on program content. Laboratory sessions provide students the opportunity to experiment with production elements influencing the interpretation of program content. Concentration on lighting, camera movement, composition, and audio support. *Prerequisite: COGN 21 or consent of instructor.*

COMT 102. Introduction to Media Use in Communication (4)
Students will engage in projects, using media, to address theories of communication. Students can use film, video, computers, pen and paper, photography, posters, or performances for their projects. *Prerequisites: COGN 20 and COGN 21.*

COMT 103. Television Documentary (6)
An advanced television course which examines the history, form, and function of the television documentary in American society. Experimentation with documentary techniques and styles requires prior knowledge of television or film production. Laboratory sessions apply theory and methods in the documentary genre via technological process. Integrates research, studio and field experience of various media components. *Prerequisite: COMT 101 or COGN 21 or consent of instructor.*

COMT 105. Media Stereotypes (4)
An examination of how the media present society's members and activities in stereotypical formats. Reasons for and consequences of this presentation are examined. Student responsibilities will be: (a) participation in measurement and analysis of stereotype presentations; (b) investigating techniques for assessing both cognitive and behavioral effects of such scripted presentations on the users of media. Course can be taken to meet COCU major requirement. *Prerequisite: COCU 100 or consent of instructor.*

COMT 107. Internet Journalism (4)
This course focuses on writing for Internet publications and using the Internet for research and hypertext bibliography. Students will be required to learn and use a web-programming language. News writing for the Internet will be compared to news writing in other media, including print journalism. *Prerequisites: communication major, COGN 20 or consent of instructor.*

COMT 109. Digital Media Pedagogy (4)
This course teaches techniques for teaching digital media: such as Word, Photoshop, PageMaker, digital cameras, digital video, non-linear editing. What are the special challenges digital media present to teachers and students? How do digital media compare to older technologies such as typewriters, film cameras, and analog video? How do gender, class, and age affect the way students and teachers respond to digital media? At least six hours of fieldwork at a computer lab of their choice or at Seiter's project at Adams Elementary will be required. Experience with computers and/or digital imaging recommended. *Prerequisite: communication majors only.*

COMT 110. News Media Workshop (4)
Designed for students working in student news organizations or off-campus internships or jobs in news, public relations, or public information. A workshop in news writing and news analysis. *Prerequisites: COCU 100 and COSF 171 (may be taken concurrently) or consent of instructor.*

COMT 111A-B. Communicating and Computers (4-4)
This course introduces students to computers as media of communication. Each quarter students participate in a variety of networking activities designed to show the interactive potential of the medium. Field work designed to teach basic methods is combined with readings designed to build a deeper theoretical understanding of computer-based communication. Courses can be taken to meet COHI major requirement. *Prerequisites: COHI 100 and communication major or consent of instructor.*

COMT 112. Ethnographic Studies of the Media (4)
This is a practical course on ethnographic fieldwork—obtaining informed consent interviewing, negotiating, formulating a research topic, finding relevant literature, writing a research paper, and assisting others with their research. Course can be taken to meet COHI major requirement. *Prerequisite: COHI 100 or consent of instructor.*

COMT 115. Media and Design of Social Learning Contexts (6)
(Same as HDP 115). A combined lecture/lab course cross listed in Communication and Human Development. Students attend lecture, write fieldnotes, and spend 3 hours per week in specially designed after-school settings working with children and designing new educational media and producing special projects. *Prerequisite: COHI 100 or HDP 1.*

COMT 116. Practicum in Child Development (6)
(Same as Psych 128, HDP 135.) A combined lecture and laboratory course for juniors and seniors in psychology and communication. Students should have a solid foundation in general psychology and communication as human information processing. Students will be expected to spend four hours a week in a supervised practical after-school setting at one of the community field sites involving children. Additional time will be devoted to readings and class prep, as well as, six hours a week transcribing field notes and writing a paper on some aspect of the field work experience as it relates to class lectures and readings. Please note that the enrollment size for each site/section is limited. See department course listing for site/section descriptions. *Prerequisite: COHI 100 or consent of instructor.*

COMT 120. Documentary Sketchbook (4)
Digital video is the medium used in this class both as a production technology and as a device to explore the theory and practice of documentary production. Technical demonstrations, lectures, production exercises, and readings will emphasize the interrelation between production values and ethics, problems of representation, and documentary history. *Prerequisite: COGN 21 or consent of instructor*

COMT 121. Sound Production and Manipulation (4)
Advanced seminar in sound production, design, editing. Students create projects by recording original sounds, editing on a Pro-Tools system. We consider the potential of sound in film, radio, TV, and the Web by reviewing work and reading sound theory. *Prerequisites: communication majors only and COGN 21.*

COMT 175. Advanced Topics in Communication, Media Methods (4)
Specialized "practice" in communication: media methods with topics to be determined by the instructor in any given quarter. May be repeated for credit three times. *Prerequisite: communication majors only.*

General Communication

COGN 150. Senior Seminar in Communication (4)
This course examines in detail some topic in the field of communication, bringing to bear several of the approaches and perspectives introduced in the basic communication curriculum. Seminars will be limited to 25 students and class participation is stressed. A research paper is required. *Prerequisite: senior standing or consent of instructor.*

COGN 175. Advanced Topics in Communication: General (2)
Specialized study in general communication with topics to be determined by the instructor, for any given quarter. May be repeated for credit. *Prerequisite: must be taken with AIP 197.*

COGN 191A-B. Honors Seminar in Communication (4)
Preparation of an honors thesis, which can be either a research paper or a media production project. Open to students who have been admitted to the honors program. Grades will be awarded upon completion of the two-quarter sequence. *Prerequisite: admission to the honors program.*

COGN 194. Research Seminar in Washington, D.C. (4)
(Same as PS 194, USP 194, Hist 193, SocE 194, Erth 194.) Course attached to six-unit internship taken by students participating in the UCDC program. Involves weekly seminar meetings with faculty and teaching assistants and a substantial research paper. *Prerequisite: participation in UCDC program.*

COGN 198. Directed Group Study in Communication (4)
Directed group study on a topic or in a field not included in the regular curriculum by special arrangement with a faculty member. (P/NP grades only.) May be taken three times for credit. *Prerequisite: consent of instructor.*

COGN 199. Independent Study (4)
Independent study and research under the direction of a member of the staff. (P/NP grades only.) *Prerequisite: consent of instructor.*

GRADUATE

COGR 200A. Introduction to the Study of Communication as Social Force (4)
This course focuses on the political economy of communication and the social organization of key media institutions. There will be both descriptive and analytical concerns. The descriptive concern will emphasize the complex structure of communication industries and organizations, both historically and cross-nationally. The analytic focus will examine causal relationships between the economic and political structure of societies, the character of their media institutions, public opinion, and public attitudes and behaviors expressed in patterns of voting, consuming, and public participation. The nature of evidence and theoretical basis for such relationships will be critically explored.

COGR 200B. Introduction to Study of Communication: Communication and Culture (4)
This course focuses on questions of interpretation and meaning. This course will examine how people use texts to interpret the world and coordinate their activities in social groups. Students will study both theories of interpretation in the conventional sense and theories about the act of interpreting.

COGR 200C. Introduction to the Study of Communication: Communication and the Individual (4)
This course will draw on theorists who examine human nature as constituted by social, material, and historical circumstances. This course considers the media in relation to the ontogenetic and historical development of the human being and an examination of the individual as socially constituted in a language-using medium. The role of new communication technologies as part of research methodologies is explored in lecture-seminar.

COGR 201B. Ethnographic Methods for Communication Research (4)
A supervised and coordinated group project will allow students to develop competence in a variety of ethnographic approaches to communication. Subjects covered include choosing a field-work site, setting or process for participation; entry and development of relationships; techniques of observation, interviewing, notetaking, and transcription. Course may also include photography and video as research tools. All participant observation and interviewing strategies fall under the review of the Committee on Human Subjects.

COGR 201C. Discourse Analysis (4)
Review and critique of studies employing discourse analysis, focusing on the ways that "discourse" is identified, recorded, and reported. A working notion of "discourse" will develop from works representing diverse disciplinary approaches. Students will record, transcribe, and report on segments of talk in an everyday setting. All participant observation and interviewing strategies fall under the review of the Committee on Human Subjects.

COGR 201D. Historical Methods for Communication Research (4)
Different approaches to conducting historical research in communication. Such approaches may include the social history of communication technology; structuralist and poststructuralist accounts of language, media, and collective memory; and new historicist treatments of cultural history. Sources, documentation, and the nature of argument from historical evidence are emphasized.

COGR 201E. Political Economic Methods for Communication Research (4)
Combines methodological critique of classic political-economic studies of communication agencies and institutions with an in-depth research project. The project serves to familiarize students with approaches to documentation and to methodological issues associated with an overarching process or trend, such as social effects of communications technologies, economic concentration in the communications industry, the information economy, transnationalization of networks, deregulation of telecommunications, or causes and impacts of increasing television programming costs.

COGR 201H. Qualitative Methods in Audience Research (4)
This course explores the social and economic definitions of media audiences and the various qualitative methodologies for studying media use. Includes audiences for television, video, and motion pictures, as well as users of telephones, computers, and electronic mail.

COGR 201I. Ethnography of Information Systems (4)
This course will survey the rapidly growing body of ethnographic analyses of information systems, to extend the basic principles of ethnographic research and to lead students in the development of projects modifying these principles for the emerging electronic environment. Students may approach the course in one (or both) of two ways—either preparing for and carrying out a pilot ethnographic study or studying the theoretical literature in depth.

COGR 201J. Comparative Analysis (4)
The logic of comparative analysis and its role in communication research. Scientific inference in qualitative research. Selection of cases. Problems of translation across cultures.

COGR 201K. Sociological Analysis (4)
This course will introduce students to selected sociological perspectives, concepts, and methods for the study of mass communication. It will explore the implications of taking social relations and social institutions, rather than individuals or cultural texts of discourses, as the chief units of analysis.

COGR 201L. Qualitative Analysis of Information Systems (4)
Historical and ethnographic studies of information systems—the design and use of information and communication technologies in their social, ethical, political, and organizational dimensions. Objects of study range from the invention of file folders to email use and distributed databases as communication systems. *Prerequisite: graduate standing or consent of instructor.*

COGR 201M. Content Analysis (4)
History uses methodology of quantitative analysis of media content. Includes conceptual issues concerning the quantification of meaning and practical procedures for coding and data analysis. Students read examples of studies using content analysis and carry out their own pilot analyses. *Prerequisite: graduate standing or consent of instructor.*

COGR 209. International Communications (4)
This course will examine the material infrastructure of communication flows internationally, focusing on the major transmitters and categories of the messages and imagery. Emphasis will be placed on the impact of international communication on national sovereignty and the character of economic development.

COGR 210. Information and Society (4)
The social, legal, and economic forces affecting the evolution of mass communication institutions and structure in the industrialized world. Differential impacts of the free flow of information and unequal roles and needs of developed and developing economies.

COGR 215. Regulation of Telecommunications (4)
The course will look at the history of, and rationales for, the regulation of mass communications in the United States. The course will cover both broadcasting and common carrier regulation. We will analyze telecommunications regulatory structures as they were constituted historically with the 1934 Communications Act and examine their breakdown in the late 1970s. In a larger vein, the course will examine the rise and functions of regulatory agencies in modern American history.

COGR 220. The News Media (4)
History, politics, social organization, and ideology of the American news media. Special attention will be paid to historical origins of journalism as a profession and "objective reporting" as ideology; empirical studies of print and TV journalism as social institutions; news coverage of Vietnam and its implications for theories of the news media.

COGR 222. Childhood and Culture (4)
This course explores the social construction of childhood as organized by the institutions of school and family. Of particular interest are media consumption and leisure as they interact with the emergence of taste, preference, and identity in children. Modern adolescence is also explored as it bears on the social nature of childhood.

COGR 225A. Introduction to Science Studies (4)
Study and discussion of classics work in history of science, sociology of science, philosophy of science, and communication of science, and of work that attempts to develop a unified science studies approach. Required for all students in the Science Studies Program. *Prerequisite: enrollment in the Science Studies Program or approval of instructor.*

COGR 225B. Seminar in Science Studies (4)
Study and discussion of selected topics in the science studies field. Required for all students in the Science Studies Program. *Prerequisite: enrollment in the Science Studies Program or approval of instructor.*

COGR 225C. Colloquium in Science Studies (4)
A forum for the presentation and discussion of research in progress in science studies, by graduate students, faculty, and visitors. Required for all students in the Science Studies Program. *Prerequisite: enrollment in the Science Studies Program or approval of instructor.*

COGR 236. Popular Culture (4)
This class will be an opportunity for students to review major contributions to the field from the disciplines of anthropology, history, literature, sociology and American studies, and to experiment with some of the recently developed methods for studying popular forms. They will then be able to consider more precisely the potential and actual contribution of studies of popular culture to the discipline of communication.

COGR 240. The Culture of Consumption (4)
(Cross-listed with HIGR 273.) This course will explore the development and cultural manifestations of consumerism in the nineteenth and twentieth centuries. Topics will include the rise of museums, the development of mass market journalism and literature, advertising, and the growth of commercial amusements. Readings will focus primarily, but not exclusively, on the United States. Students will be encouraged to think comparatively.

COGR 245. Performance and Audience (4)
This course will explore the history and nature of audience as a concept and phenomenon. The first half of the term will be spent surveying the historical nature of the relations of audience to performance and to social groups. The second half of the course will address modern and contemporary aspects of audience, taking into consideration the effects of radio, film, and television on audience and nature of audience in contrasting cultures such as that of contemporary China and the United States.

COGR 261. Mediational Approaches to Culture/Mind (4)
This course will examine theories of mind in which cultural mediation is given a leading role. The work of anthropologists, psychologists, and communication scholars will be studied in depth. Emphasis will be placed on the methodological implication of cultural theories of mind for empirical research.

COGR 265. Literacy (4)
This course will examine the historical growth of literacy from its earliest precursors in the Near East. The interrelation between literate technology and social organization and the impact of literacy on the individual will be twin foci of the course. Arriving at the modern era, the course will examine such questions as the impediments to teaching reading and writing skills to all normal children in technological societies and the relation between literacy and national development in the Third World.

COGR 266. Ethnography of Information Systems (4)
In this course students will survey the rapidly growing body of ethnographic analyses of information systems, extend basic principles of ethnographic research, and lead students in the development of projects modifying these principles for the emerging electronic environment. Students will carry out a series of fieldwork exercises and discuss notes and results in class.

COGR 275. Topics in Communication (4)
Specialized study in communication, with topics to be determined by the instructor for any given quarter.

COGR 280. Advanced Workshop in Communication Media (4)
This course is a project course in which students prepare a production or experiment using one of the forms of media. The course is designed to allow students to experiment in a communication form other than the usual oral presentation in class or a term paper. Students can do a video production, a coordinated photographic essay or exhibit, a computer insructional game, a published newspaper or magazine article directed at a special audience, a theatrical presentation, or some form other than those listed. *Prerequisite: graduate standing or consent of instructor.*

COGR 294. The History of Communication Research (4)
Intellectual history of the field of communication studies from Robert Park to the present. Explication and assessment of major research approaches and classic studies representing both empirical and critical traditions.

COGR 296. Communication Research as an Interdisciplinary Activity (4)
A course that introduces students to the interdisciplinary nature of the field of communication research as represented by the work of faculty in the Department of Communication. Through faculty research, students are presented with concrete examples of communication reseaarch theory and practice that can provide them with insights for conducting their own research projects. *Prerequisite: graduate standing or consent of instructor.*

COGR 298. Directed Group Study (1-12)
The study and analysis of specific topics to be developed by a small group of graduate students under the guidance of an interested faculty member. COGR 500. Practice Teaching in Communication (4)

COGR 299. Graduate Research (1-12)
Advanced independent study in communication under the guidance of Department of Communication faculty.

COGR 500. Practice Teaching in Communication (4)
A doctoral student in communication is required to assist in teaching undergraduate Department of Communication courses for a total of six quarters. One meeting per week with the instructor, one meeting per week with the assigned sections, and attendance at the lecture of the undergraduate course in which he or she is participating are part of this requirement.

Comparative Studies in Language, Society, and Culture

OFFICE: 3354 Literature Building
(858) 534-3826/(858) 534-3217
http://www.literature.ucsd.edu

Program Faculty

Michael Meeker, Ph.D. *Department of Anthropology*
Jann Pasler, Ph.D. *Department of Music*
Don E. Wayne, Ph.D. *Department of Literature*

Graduate students in the humanities, social sciences, and arts in this program are provided the opportunity to design curricula, conduct research, and write dissertations under the guidance of interdepartmental and/or intercampus Ph.D. committees. The student who participates in the program must be admitted, satisfy all requirements for advancement to candidacy, and pass the qualifying examination in one department. The student must also undertake advanced study in an integrally related area of research specialization. The student advances to candidacy in the program upon successfully defending a written dissertation proposal before the interdepartment and/or intercampus Ph.D. committee. In the instance of some departments and programs, the defense will be identical with completion of the departmental qualifying examination.

Application to the program in Comparative Studies may be made at the earliest during the student's third quarter of residency in his or her primary department. From the point of acceptance into the program, the student's preparation for dissertation research will be under the supervision of the interdepartment or intercampus Ph.D. committee. The degree granted may indicate in its title the precise nature of the student's studies and research when appropriate and desirable—e.g., Ph.D. in comparative literature and ethnopoetics, in linguistics and literary studies, in economics and Chinese studies, in philosophy and the history of ideas. When an additional degree title is contemplated, the student's Ph.D. committee must forward a program of study and research, as well as the dissertation proposal, to the supervising committee for initial approval and to the Graduate Council for final approval.

Students applying for admission to UCSD and interested in applying for admission to the program should direct their inquiries to a primary department. Students already admitted to a primary department should, after the required quarters of residence and with the advice of a department adviser, direct inquiries to the chairperson of the program.

Faculty Research Groups

Beginning with the academic year 1997–1998, the program sponsors a series of faculty research

groups. These groups consist of faculty who have announced their intention to supervise graduate students wishing to work on topics involving the comparative study of language, society, and culture. Each faculty research group is expected to be composed of faculty in the humanities, social sciences, and arts from different departments and/or campuses. For a list of current faculty research groups and the topics which they support, contact the chairperson of the program.

The Anthropology of Modern Society

The Anthropology of Modern Society is a project of graduate training and research dedicated to the study of modernity and its counterpoints in the late twentieth century. The group sees the social life of cities as making manifest this problem in issues of citizenship and democracy, social formations in tension with the nation-state, modern subjectivities, social and religious movements, transnational markets and migrations, and relations of local to global processes. Participants are committed to reorienting anthropological theory and ethnographic practice towards such contemporary social and political problems.

Director: James Holston,
Department of Anthropology, (858) 534-0111

Co-Director: Martha Lampland,
Department of Sociology, (858) 534-5640

Ph.D. Time Limit Policies

A student admitted to this interdisciplinary program is subject to the same time limit policies as those of the student's primary department.

Computer Science and Engineering

See Engineering, School of.

Contemporary Black Arts Program

OFFICE: Thurgood Marshall College
Administration Building, Room 120

Director

Provost, Thurgood Marshall College

Faculty

Ken Anderson, *Visiting Lecturer, Music*
Robert Cancel, *Associate Professor, Literature*
Floyd Gaffney, Ph.D., *Professor Emeritus, Theatre*
Sandra Foster-King, M.F.A., *Visiting Lecturer, Theatre*
George Lewis, *Professor, Music*
Cecil Lytle, B.A., *Professor, Music*
Faith Ringgold, M.A., *Professor, Visual Arts*

The Minor

The Contemporary Black Arts Program is an interdisciplinary minor which provides a broad introduction to an appreciation of Afro-American performing arts through lecture, studio courses, and public performance. Students complete twenty-eight units, with a minimum of twenty upper-division units. Students who complete the minor must meet the following requirements:

1. A required core of four lecture courses chosen from:

Theatre	THHS 101 (Topics: African American Theatre)
Music	Music 127A (Music of Black Americans)
Visual Arts	VA 126DN (African and African American Arts)
Literature	LTEN 17 (Intro to African American Lit)
History	HIUS 135a (Origins of the Atlantic World, c. 1450–1650) or HIUS 135b (Slavery and the Atlantic World)

2. A fifth lecture course selected from the following approved list:

Literature/English 185. Themes in Afro-American Literature (4)

Literature/English 188. Contemporary Caribbean Literature (4)

Literature/English 148. Genres in American Lit (4)

Literature/English 183. African American Prose (4)

Literature/English 184. African American Poetry (4)

Literature/Writing 100. Beginning Fiction (4)

Literature/Writing 102. Poetry (4)

Literature/Writing 120. Personal Narrative (4)

Music 126. Introduction to Oral Music (4)

Music 127B. Music of Black Americans (4)

VA 1. Introduction to Art Making (4)

3. A total of eight units of performance courses selected from the following approved list:

Music 95G. Gospel Choir (2)

Music 95J. Jazz Ensemble (2)

Music 131. Jazz Improvisation (4)

Theatre/Dance 132. Dances of the World (4)

Theatre/Acting 120. Ensemble (4)

Students interested in either taking Contemporary Black Arts Program courses or completing the minor are encouraged to discuss their interests and develop a course of study with a faculty member of the program at their earliest convenience. See the Marshall College Provost's Office for further information.

Contemporary Issues

OFFICE: 2073 Humanities and Social Sciences Building, Muir College, (858) 534-3589

Acting Director

Susan Kirkpatrick, Ph.D.

COURSES

LOWER-DIVISION

22. Human Sexuality (4)
A survey of the nature and problems of human sexuality in the development of the individual, in cultural traditions and values, and in social roles and organizations, particularly with regard to contemporary America. L. Ross

40. Contemporary Issues: The AIDS Epidemic (4)
Using current information, this course will deal with the worldwide spread of AIDS, particularly into communities, colleges, and unversities. Discussion topics: origin, infection, biology, clinical expression, risks, vaccines, epidemiology, and the social, ethical, economic, and legal aspects of this epidemic.

50. Information and Academic Libraries (2)
An introduction to research strategies directed at satisfying the information needs of the student using the academic library, with emphasis on the UCSD library system. Library techniques will be acquired through lectures and discussion, problem sets, and a term project. Students will learn to extend these techniques to independent research.

UPPER-DIVISION

136. The Anthropology of Medicine (4)
(Same as ANGN 128.) Theoretical approaches to and cross-cultural analyses of the role of the medical profession, the sick and the healers, and culture as com-

munication in the medical event. The theoretical anthropological aspects of medical practice and medical research will include a consideration of the "Great Traditions" of medicine as well as primitive and peasant systems. Western medicine will be considered in the foregoing framework, with issues of contemporary concern by way of introduction. *Prerequisite: upper-division standing.* L. Ross

195. Discussion Leading in Contemporary Issues (4)
Students will lead groups of ten to twenty students in discussions of contemporary concern. Students will meet with the professor to plan and prepare for their discussions to be held weekly. Students will also consult with another faculty member specializing in their topics for further check on reading materials and course of discussion. (P/NP grades only.) *Prerequisite: Contem-porary Issues 196 and consent of the director of Interdisciplinary Sequences.*

196. Contemporary Issues Workshop (2)
A workshop for potential discussion leaders in the Contemporary Issues Program. Students will investigate topics for discussion and methods of presentation and inquiry. Participating in the workshop does not guarantee selection as discussion leader. (P/NP grades only.)

198. Group Studies in Contemporary Issues (4)
Group studies, readings, projects, and discussions in areas of contemporary concern. Course is set up so that students may work together as a group with a professor in an area of contemporary concern whereby the group emphasis would be more beneficial and constructive than individual special studies. *Prerequisite: consent of instructor. (P/NP grades only.)*

199. Special Studies in Contemporary Issues (2-4)
To be offered during fall, winter, and spring quarters. Permission of the director of Interdisciplinary Sequences is required. The 199 course is to be made up of individual reading and projects in the areas of contemporary concern. Term paper and/or completed project is required. This class is given under special circumstances, e.g., student abroad. (P/NP grades only.)

500. Apprentice Teaching in Contemporary Issues (4)
A course in which teaching assistants are aided in learning proper teaching methods by means of supervision of their work by the faculty: handling of discussions, preparation and grading of examinations and other written exercises, and student relations. *Prerequisite: graduate standing.*

Critical Gender Studies

(Formerly Women's Studies)

OFFICE: 2073 Humanities & Social Sciences Building, Muir College, (858) 534-3589

Affiliated Faculty

Professors

R. Michael Davidson, Ph.D., *Literature*
Zeinabu Davis, M.F.A., *Communication*
Page du Bois, Ph.D., *Literature*
Yen Espiritu, Ph.D., *Ethnic Studies*
Judith Halberstam, Ph.D., *Literature*
Jorge Huerta, Ph.D., *Theatre and Dance*
Judith Hughes, Ph.D. *History*
Christine F. Hunefeldt, Ph.D., *History*
Susan Kirkpatrick, Ph.D., *Literature*
Rebecca Klatch, Ph.D., *Sociology*
Todd Kontje, Ph.D., *Literature*
Lisa Lowe, Ph.D., *Literature*
Babette Mangolte, Ph.D., *Visual Arts*
Louis Montrose, Ph.D., *Literature*
Chandra Mukerji, Ph.D., *Communication*
Eileen Myles, B.A., *Literature*
Carol Padden, Ph.D., *Communication*
Jann Pasler, Ph.D., *Music*
Carol Plantamura, M.F.A., *Music*
Marta Sánchez, Ph.D., *Literature*
Rosaura Sánchez, Ph.D., *Literature*
Susan Leigh Star, Ph.D., *Communication*
Shirley Strum, Ph.D., *Anthropology*
Ana Celia Zentella, Ph.D., *Ethnic Studies*
Omelbanine Zhiri, Ph.D., *Literature*

Associate Professors

Suzanne Brenner, Ph.D., *Anthropology*
Nancy Caciola, Ph.D., *History*
Elizabeth Cartwrisht, Ph.D., *Communication*
Maria Charles, Ph.D., *Sociology*
Ann Craig, Ph.D., *Political Science*
Steven Epstein, Ph.D., *Sociology*
Rosemary George, Ph.D., *Literature*
Nadine George-Groves, Ph.D., *Theatre and Dance*
Valerie Hartouni, Ph.D., *Communication*
Stephanie Jed, Ph.D., *Literature*
Nicole King, Ph.D., *Literature*
Rachel Klein, Ph.D., *History*
Martha Lampland, Ph.D., *Sociology*
Michael Meranze, Ph.D., *History*
Naomi Oreskes, Ph.D., *History*
David Pellow, Ph.D., *Ethnic Studies*
Pamela Radcliff, Ph.D., *History*
Roddey Reid, Ph.D., *Literature*
Jane Rhodes, Ph.D., *Ethnic Studies*
Nayan Shah, Ph.D., *History*
Kathryn Shevelow, Ph.D., *Literature*
Susan Smith, Ph.D., *Visual Arts*
Shelley Streeby, Ph.D., *Literature*
Nicole Tonkovich, Ph.D., *Literature*
Cynthia Truant, Ph.D., *History*
Cynthia Walk, Ph.D., *Literature*
Winifred Woodhull, Ph.D., *Literature*
Lisa Yoneyama, Ph.D., *Literature*

Assistant Professors

Mary Blair-Loy, Ph.D., *Sociology*
John Blanco, Ph.D., *Literature*
Boatema Boateng, Ph.D., *Communication*
Giovanna Chesler, M.F.A., *Communication*
Shalanda Dexter, Ph.D., *Communication*
Camille Forbes, Ph.D., *Literature*
Marta Hanson, Ph.D., *History*
Christine R. Harris, Ph.D., *Psychology*
Sara Johnson La-O, Ph.D., *Literature*
Jin-Kyung Lee, Ph.D., *Literature*
Weijing Lu, Ph.D., *History*
Natalia M. Molina, Ph.D., *Ethnic Studies*
Esra G. Ozyurek, Ph.D., *Anthropology*
Lisa Sun-Hee Park, Ph.D., *Ethnic Studies*
Rebecca Plant, Ph.D., *History*
Lisa E. Sanchez, Ph.D., *Critical Gender Studies and Ethnic Studies*
Denise Ferreira da Silva, Ph.D., *Ethnic Studies*
Stephanie Smallwood, Ph.D., *History*
Brett St. Louis, Ph.D., *Ethnic Studies*
Daniel Widener, Ph.D., *History*
Elana Zilberg, Ph.D., *Communication*

Adjunct Professor

Mary Walshok, Ph.D., *Sociology*

Associate Adjunct Professor

Susanne Cahill, Ph.D., *History*

Critical Gender Studies

The UCSD Critical Gender Studies Program, formerly Women's Studies, is an interdisciplinary academic program, offering students the opportunity to study gender, race, class, sexuality, and nationalism as intersecting categories of analysis and experience. Some basic questions that anchor the program's core curriculum include asking how these categories become institutionalized and yet change over time? How do they work together to shape individual identity?; contribute to the organization of social life?; become essential to the production of many different kinds of knowledge about that life?

The program's core curriculum builds upon feminist scholarship of the last decade, incorporating the new interdisciplinary agendas, intellectual debates, changing methodological practices, and major scholarly shifts that have reshaped the field of women's studies. Informed by the insights of critical race feminism, feminist critiques of conventional domains of knowledge, and gay and

lesbian inquiries challenging traditional understandings and assumptions about sexuality, this new core curriculum is designed to move students beyond simple binary descriptions and contemporary, popularized accounts of gender. Instead, gender is analyzed in the full complexity of its construction over time and in a variety of cultural, scholarly, and global arenas.

Students can expect to encounter a rich spectrum of approaches in studying these complex constructions—the majority of a student's advanced work in the program consists of upper division courses from history, communication, literature, ethnic studies, sociology, anthropology, philosophy, and political science. However, despite their important differences, what these approaches share is a *critical* stance with respect to the subject of gender. This stance, reflected in the program's name "*Critical Gender Studies*," refuses easy answers when exploring the social relations of gender and reaches, instead, for detailed accounts of the intricacies and paradoxes of power through which these relations are and have been made and maintained.

Critical gender studies prepares undergraduates for a variety of careers through the study of social, political, economic, historical, and cultural contexts. For example, the interdisciplinary and multi-disciplinary course work that students complete as part of a major in critical gender studies provides an excellent foundation for those students with career aspirations in law, medicine and health sciences, public administration, and social services. Students wishing to pursue doctoral work will also find that interdisciplinary training in critical gender studies equips them with theoretical and methodological strengths in most disciplines and applied research fields. Specialists in gender studies are increasingly being used as consultants in industry, higher education, insurance companies, and personnel firms. State and federal government agencies require people who have special training in analyzing gender relations. Finally, educational institutions need specialists to develop and administer women's centers and gay and lesbian centers as well as other institutional structures and programs.

The Critical Gender Studies Program offers two options of study: an undergraduate major and an undergraduate minor (or program of concentration). To declare a major, a department stamp is required. Because critical gender studies is an interdisciplinary major, it is important to work closely with a faculty adviser in the planning of your program.

Preparation for the Major and Minor

All critical gender studies majors and minors are required to take the Introduction to Critical Gender Studies sequence: Critical Gender Studies 2A-B, 100, and 101.

Major Program

Students are required to concentrate in one of five cluster areas: culture and representation; sexualities; work, migration, and globalization; science, technology, and medicine; history, society, and inequalities. Concentrating in a cluster area entails taking five upper-division courses (twenty units) in that area. To complete the major, students are required to complete five additional upper-division courses (twenty units) in cluster areas outside their chosen area of concentration. At least one of the five upper-division courses a student takes outside their chosen area of concentration must be selected from the program's upper-division course list.

CONCENTRATION IN CULTURE AND REPRESENTATION

Group A. **Five upper-division courses (twenty units) in the culture and representation cluster area** from the critical gender studies approved course list.

Group B. **Five upper-division courses (twenty units) in cluster areas other than culture and representation** to be selected from the critical gender studies approved and petitionable course list. At least one of these courses must be chosen from Critical Gender Studies 102-103-104. All five courses may be chosen from Critical Gender Studies 102-103-104 (i.e., each course may be repeated once, provided the course content is different). A maximum of three courses (twelve units) may be selected in any one cluster area.

CONCENTRATION IN SEXUALITIES

Group A. **Five upper-division courses (twenty units) in the sexualities cluster area,** from the critical gender studies approved course list.

Group B. **Five upper-division courses (twenty units) in cluster areas other than sexualities** to be selected from the critical gender studies approved and petitionable course list. At least one of these courses must be chosen from Critical Gender Studies 102-103- 104. All five courses may be chosen from Critical Gender Studies 102-103-104 (i.e., each course may be repeated once, provided the course content is different). A maximum of three courses (twelve units) may be selected in any one cluster area.

CONCENTRATION IN WORK, MIGRATION, AND GLOBALIZATION

Group A. **Five upper-division courses (twenty units) in the work, migration, and globalization cluster area,** from the critical gender studies approved course list.

Group B. **Five upper-division courses (twenty units) in cluster areas other than work, migration, and globalization** to be selected from the critical gender studies approved and petitionable course list. At least one of these courses must be chosen from Critical Gender Studies 102-103-104. All five courses may be chosen from Critical Gender Studies 102-103-104 (i.e., each course may be repeated once, provided the course content is different). A maximum of three courses (twelve units) may be selected in any one cluster area.

CONCENTRATION IN SCIENCE, TECHNOLOGY, AND MEDICINE

Group A. **Five upper-division courses (twenty units) in the science, technology, and medicine cluster area,** from the critical gender studies approved course list.

Group B. **Five upper-division courses (twenty units) in cluster areas other than science, technology, and medicine** to be selected from the critical gender studies approved and petitionable course list. At least one of these courses must be chosen from Critical Gender Studies 102-103-104. All five courses may be chosen from Critical Gender Studies 102-103-104 (i.e., each course may be repeated once, provided the course content is different). A maximum of three courses (twelve units) may be selected in any one cluster area.

CONCENTRATION IN HISTORY, SOCIETY, AND INEQUALITIES

Group A. **Five upper-division courses (twenty units) in the history, society, and inequalities cluster area,** from the critical gender studies approved course list.

Group B. **Five upper-division courses (twenty units) in cluster areas other than history, society, and inequalities** to be selected from the critical gender studies approved and petitionable

course list. At least one of these courses must be chosen from Critical Gender Studies 102-103-104. All five courses may be chosen from Critical Gender Studies 102-103-104 (i.e., each course may be repeated once, provided the course content is different). A maximum of three courses (twelve units) may be selected in any one cluster area.

Honors Program

The Critical Gender Studies Honors Program allows advanced critical gender studies majors to pursue individual projects in the context of collective intellectual exchange with their peers and advising faculty. Students are eligible if they a) have senior standing at the time they begin the program, b) are approved by the critical gender studies faculty director and steering committee. Normally, students eligible for honors will have a 3.5 grade-point average in upper-division courses taken for the major, but highly motivated students who do not meet this criterion may be admitted to the program at the discretion of the director and the critical gender studies steering committee.

In the fall quarter of their senior year, students take the Honors Seminar (CGS 190), taught by a member of the critical gender studies faculty. The first half of the quarter is devoted to intensive analysis and discussion of recent publications in the fields of gender and sexuality. During the second half of the quarter, each student develops a short thesis proposal and presents it for group discussion. While taking the Honors Seminar, each student also registers for CGS 196A: The Honors Thesis, 4 units of independent study with a faculty member associated with critical gender studies. With the guidance of this adviser, the student carries out background research for the thesis prospectus and selects a thesis director. In the winter quarter, students complete the thesis under the supervision of their thesis director in the Honors Thesis course, CGS 196B.

In the spring quarter, each student who has successfully completed a thesis will present it in the CGS 90 undergraduate seminar.

Students who complete the Honors Seminar and the thesis with a combined grade of B+ or above and make the required oral presentation of the thesis in CGS 90 have the words "with distinction" added to the notation of the major on their diplomas and transcripts.

Double Major in Critical Gender Studies and Another Department or Program

Students who wish to major both in critical gender studies and in another department or program must fulfill all requirements for the critical gender studies major as described above. Students must submit a double major petition for approval by the participating departments and the student's provost. Critical gender studies will accept up to two upper-division courses which overlap requirements for the two majors.

Minor Program (and Program of Concentration)

Critical gender studies minors are required to complete the Introduction to Critical Gender Studies sequence: Critical Gender Studies 2A-B, 100, and 101 and three additional upper-division courses (twelve units) applicable to the critical gender studies major and minor. Students may take all three required upper-division courses in the same cluster area or three upper-division courses in three different cluster areas. Students who petition the critical gender studies minor (or program of concentration) with junior or senior standing may petition to substitute two comparable upper-division critical gender studies courses for Critical Gender Studies 2A or 2B. Critical gender studies permits one lower-division course and one upper-division course to be taken P/NP. College grading options vary. Please see college academic advisers and critical gender studies advisers.

Special Studies, Internships, and Grade Options

Many critical gender studies majors and minors elect to do gender research under the rubrics of Directed Group Study (198), Independent Study (199), internships, and mentor programs. Because these courses can be taken only with a P/NP grade option, the number of such courses to be applied to the major should be carefully discussed with a critical gender studies adviser. Some graduate and professional schools will consider it easier to evaluate a student's transcript if there are more letter grades. College guidelines and requirements for grade options also vary. Please see college academic advisers and critical gender studies advisers.

COURSES

LOWER-DIVISION

CGS 2A. Introduction to Critical Gender Studies: Social Movements (4)
The role of social movements in contesting rights and representation in comparative and historical contexts. Historical examples in the U.S. and other locations including: civil rights, men's movements, antiracist feminism, women's movements, AIDS activism, transgenderism, immigrant rights, and the labor movement in the U.S.

CGS 2B. Introduction to Critical Gender Studies: Gender and Institutions (4)
This course examines how gender organizes and is organized by institutions. Domains of inquiry may include family, education, medicine, technology, law, media, the workplace, immigration, and citizenship.

CGS 90. Undergraduate Seminar (1)
This seminar will introduce students to current interdisciplinary research topics and methods in the study of gender and sexuality. UCSD Faculty members, as well as distinguished outside visitors, will be invited to present their work.

UPPER-DIVISION

CGS 100. Conceptualizing Gender: Theories and Methods (4)
This course will compare the uses of gender as a category of analysis across academic disciplines in the Humanities, Social Sciences, and Natural Sciences with particular attention to research methodologies.

CGS 101. Gender, Modernity, and Globalization (4)
The global effects of modernity, modernization, and globalization on men and women. Topics: international consumer culture; international divisions of labor; construction of sexuality and gender within global movements; the migrations of people, capital, and culture. *Prerequisite: upper-division standing or consent of instructor.*

CGS 102. Selected Topics in Critical Gender Studies (4)
An interdisciplinary course focusing on one of a variety of topics in gender studies, such as gender and science, the body, reproductive technologies, public policy. May be taken for credit three times when topics vary. *Prerequisites: upper-division standing or consent of instructor.*

CGS 103. Feminist Theory (4)
An interdisciplinary course in feminist theory. Topics may range from a general survey of feminist theory in a variety of disciplines to a more focused interdisciplinary theoretical topic such as postmodernism and feminism. May be taken for credit three times when topics vary. *Prerequisites: upper-division standing or consent of instructor.*

CGS 104. Advanced Topics in Comparative Perspectives (4)
Focuses on the relationship between gender and culture from a multiplicity of perspectives. Possible topics could include gender and ethnicity, gender across class, and other topics to be examined in a cross cultural framework. May be taken for credit two times when topics vary. *Prerequisites: upper-division standing or consent of instructor.*

CGS 105. Queer Theory (4)
Examines the different methodologies and disciplinary histories that together constitute the interdisciplinary project called *queer studies*. Of particular interest will be how these different methodologies and history construe and construct the relations between gender, race, class, and nation. *Prerequisites: upper-division standing or consent of instructor.*

CGS 106. Gender Equality and the Law (4)
Explores the legal treatment of discrimination on the basis of gender, including equal protection doctrine and some statutory law such as Title VII. Topics include the meaning of gender equality in such areas as single-sex education, military service, sexual harassment, discrimination on the basis of pregnancy, and other current issues. *Prerequisites: upper-division standing or consent of instructor.*

CGS 107. Gender and Reproductive Rights (4)
Legal treatment of gender, reproductive rights, and the family, particularly as evolving law, primarily in the U.S., has created conflicting rights, roles, and responsibilities. Topics include abortion, fetal rights, surrogacy, marriage, and child custody issues. *Prerequisites: upper-division standing or consent of instructor.*

CGS 109A. Gender, Science, Technology (4)
Examines impact of gender and racialized gender on the production and uses of science and technology. Issues include (but are not limited to): racism and biotechnology, biological determinism, eugenics, plagiarism and invisible work, information technologies and access, and the politics of museums. *Prerequisites: upper-division standing or consent of instructor.*

CGS 109B. Gender and Information Technology (4)
Explores how gender and racialized gender affect and are affected by information technology. Through the use of feminist and race-critical approaches, the course examines the impact of information technology on workplaces, the family, gender identity, and the environment. *Prerequisites: upper-division standing or consent of instructor.*

CGS 110A. Women and Sport (4)
Examines the history of women and sport in the U.S. and changes since the passage of Title IX (federal equity legislation) in 1972. Explores the evolution of women in sport from historical, social, racial, psychological, political, and legal perspectives. *Prerequisites: upper-division standing or consent of instructor.*

CGS 110B. Title IX and Gender Equity in Sports and Education (4)
Comprehensive review of Title IX (federal equity legislation) and its impact on gender equity in U.S. sports and education. Explores policy interpretations, changes in educational opportunities and sports programs resulting from legislation and related court cases. *Prerequisites: upper-division standing or consent of instructor.*

CGS 111. Gender and the Body (4)
Various approaches to the study of gendered bodies. Possible topics to include masculinities/feminities; lifecycles; biology, culture, and identity; medical discourses and health issues. May be taken for credit three times when topics vary. *Prerequisites: upper-division standing or consent of instructor.*

CGS 112. Sexuality and Nation (4)
(Cross-listed with ETHN 127.) This course explores the nexus of sex, race, ethnicity, gender, and nation and considers their influence on identity, sexuality, migration movement and borders, and other social, cultural, and political issues that these constructs affect. *Prerequisites: upper-division standing or consent of instructor.*

CGS 190. Honors Seminar (4)
Interdisciplinary readings in feminist theory and research methodology to prepare students for writing an honors thesis. Open to Critical Gender Studies majors who have been admitted to Critical Gender Studies Honors Program. May be applied toward primary concentration in Critical Gender Studies major. *Prerequisites: admission to Critical Gender Studies Honors Program and department stamp required.*

CGS 196A. Critical Gender Studies Honors Research (4)
A program of independent study providing candidates for Critical Gender Studies honors to develop, in consultation with an adviser, a preliminary proposal for the honors thesis. An IP grade will be awarded at the end of this quarter. A final grade for both quarters will be given upon completion of Critical Gender Studies 196B. *Prerequisites: consent of instructor and department stamp required.*

CGS 196B. Honors Thesis (4)
Honors thesis research and writing for students who have completed Critical Gender Studies 190 and 196A. A letter grade for both Critical Gender Studies 196A and 196B will be given at the completion of this quarter. *Prerequisites: consent of instructor and department stamp required.*

CGS 198. Directed Group Study (4)
Directed group study on a topic not generally included in the Critical Gender Studies curriculum. *Prerequisites: consent of instructor and director of Critical Gender Studies Program and department stamp required.*

CGS 199. Independent Study (4)
Tutorial; independent study on a topic not generally included in the curriculum. *Prerequisites: consent of instructor and director of Critical Gender Studies Program and department stamp required.*

CGS 500. Apprentice Teaching in Critical Gender Studies (4)
Consideration of pedagogical methods appropriate to undergraduate teaching in Critical Gender Studies courses under supervision of instructor of course. Instructor will define apprentice's responsibilities in preparing class presentations, directing student discussions, evaluating and grading students' work, and maintaining productive association with students.

APPLICABLE AND PETITIONABLE COURSES

Gender-based courses offered by UCSD departments fall into two categories: applicable and petitionable. Applicable courses are those which have been approved as always applying to the CGS major and minor. Petitionable courses are either new and therefore not yet approved as applicable or are "topics" courses which focus on gender only in particular quarters. Petitionable courses may be approved by petition to the major/minor during the quarters in which they appear in the CGS quarterly lists.

QUARTERLY LISTS

Each quarter, when the upcoming quarter's *Schedule of Classes* is published, the Critical Gender Studies quarterly list is available in the CGS office and at the Web site. It is an important, comprehensive source of information about CGS course offerings as well as those from departments throughout the campus. It identifies by cluster areas both applicable as well as petitionable courses for a given quarter. For reference, the office and the Web site maintain archives of quarterly lists.

CRITICAL GENDER STUDIES CLUSTER AREAS

(**NOTE:** Only applicable courses are listed here. For petitionable courses, please see the quarterly lists mentioned above.)

1. Culture and Representation:

ANRG 117. Gender Across Cultures

COCU 132. Gender and Media

COCU 137. Politics of Bodies

COCU 138. Feminist Theory

COMT 106. Feminist Video Workshop

ETHN 165. Sex and Gender in African American Communities

ETHN 183. Gender, Race, Ethnicity and Class

HIEU 133. Gender in Antiquity and the Early Medieval Mediterranean

HIEU 147. The History of Women in Europe: Middle Ages to the Early Modern Era

HIEU 148. European Women: The Enlightenment to the Victorian Era

HIEU 149. History of Women in Europe: 1870 to Present

HIEU 180. Topics in European Women's History

HILA 117. Indians, Blacks, and Whites: Family Relations in Latin America

HIUS 130. Cultural History from 1607 to the Civil War

HIUS 131. Cultural History from the Civil War to the Present

HIUS 156. American Women, American Womanhood

HIUS 157. American Women, American Womanhood 1870 to Present

HIUS 172. Feminist Tradition in America

HIUS 176. Race and Sexual Politics

LTCS 130. Gender, Race/Ethnicity, Class and Culture

LTCS 135. Interdisciplinary Approaches to Lesbian, Gay, Bisexual, and Transgendered Studies

LTEN 120E. Women in the Eighteenth Century

LTEN 146. Women and English/American Literature

LTEN 150. Gender, Text, and Culture

LTEN 185. Themes in African American Literature

LTEU 102. Women in Antiquity (was LTGN 101)

LTEU 147. Women in Italy

LTTH 101. Issues in Feminist Theory

LTWL 155. Gender Studies (was LTGN 189)

LTWL 160. Women and Literature (was LTGN 187)

MUSIC 115. Women in Music

PHIL 169. Feminism and Philosophy

POLI 116A. Feminist Theory

SOC/B 118. Sociology of Gender and Roles

SOC/B 118A. (Crosslisted with LIGN 174) Gender and Language in Society

SOC/B 119. Sociology of Sexuality and Sexual Identities

SOC/B 130. Interdisciplinary Approaches to Lesbian, Gay, Bisexual, and Transgendered Studies

SOC/C 129. The Family

VIS 121C. Art and Gender

2. Sexualities

COCU 137. Politics of Bodies

COCU 138. Feminist Theory

ETHN 165. Sex and Gender in African American Communities

HIUS 176. Race and Sexual Politics

LTCS 135. Interdisciplinary Approaches to Lesbian, Gay, Bisexual, and Transgendered Studies

LTEN 120E. Women in Eighteenth Century

LTEN 150. Gender, Text, and Culture

LTEU 102. Women in Antiquity (was LTGN 101)

LTWL 155. Gender Studies (was LTGN 189)

LTTH 101. Issues in Feminist Theory

POLI 107A. Gay and Lesbian Politics

POLI 116A. Feminist Theory

PSYCH 147. Gender

SOC/B 119. Sociology of Sexuality and Sexual Identities

SOC/B 130. Interdisciplinary Approaches to Lesbian, Gay, Bisexual, and Transgendered Studies

3. Work, Migration, and Globalization

ANRG 117. Gender Across Cultures

COCU 138. Feminist Theory

HIEA 137. Women and Family in Chinese History

HILA 161. History of Women in Latin America

LTCS 130. Gender, Race/Ethnicity, Class and Culture

LTTH 101. Issues in Feminist Theory

POLI 134P. Organizing Women in Latin America

SOC/A 103F. Feminist Criticism and Social Theory

SOC/C 132. Gender and Work

4. Science, Technology, Medicine

COCU 137. Politics of Bodies

COCU 138. Feminist Theory

HISC 103. Gender and Science in Historical Perspective

PSYCH 147. Gender

5. History, Society, and Inequalities

COCU 137. Politics of Bodies

COCU 138. Feminist Theory

ETHN 165. Sex and Gender in African American Communities

ETHN 183. Gender, Race, Ethnicity and Class

HIEA 137. Women and Family in Chinese History

HIEU 133. Gender in Antiquity and the Early Medieval Mediterranean

HIEU 147. History of Women in Europe: Middle Ages to Early Modern Era

HIEU 148. History of Women in Europe: Early Enlightenment to Victorian Era

HIEU 149. History of Women in Europe: 1870 to the Present

HIEU 180. Topics in European Women's History

HILA 117. Indians, Blacks, and Whites: Family Relations in Latin America

HILA 161. History of Women in Latin America

HITO 164. Gender Differences in Historical Perspective

HIUS 130. Cultural History from 1607 to the Civil War

HIUS 131. Cultural History from the Civil War to the Present

HIUS 156. American Women, American Womanhood

HIUS 157. American Women, American Womanhood: 1870 to Present

HIUS 172. Feminist Traditions in America

HIUS 173. Topics in American Women's History

HIUS 176. Race and Sexual Politics

LTCS 130. Gender, Race/Ethnicity, Class, and Culture

LTCS 135. Interdisciplinary Approaches to Lesbian, Gay, Bisexual, and Transgendered Studies

LTEN 185. Themes in African American Literature

LTEU 102. Women in Antiquity

LTTH 101. Issues in Feminist Theory

LTWL 155. Gender Studies (was LTGN 189)

POLI 107A. Gay and Lesbian Politics

POLI 115A. Gender and Politics

POLI 116A. Feminist Theory

POLI 116B. Advanced Feminist Theory

POLI 166F. The American Welfare State

SOC/A 103F. Feminist Criticism and Social Theory

SOC/B 118. Sociology of Gender

SOC1B 118A. (Crosslisted with LIGN 174) Gender and Language in Society

SOC/B 130. Interdisciplinary Approaches to Lesbian, Gay, Bisexual, and Transgendered Studies

Culture, Art, and Technology

OFFICE: Multi-Purpose Building, second floor
http://sixth.ucsd.edu/

Program Director

Linda Strauss, Ph.D.

The theme of Sixth College was prompted by the rich intellectual challenges at the intersection of technology and the arts as historically imbedded within diverse cultures. The academic plan develops the college theme through a curriculum that prepares students for a future that demands an aptitude for thinking analytically and moving fluently between worlds of theory and practice; the ability to adapt to rapid change; skill at teamwork; competence and enthusiasm in searching out, assessing, and integrating text, image, and sound; a critical understanding of media and the forms in which new information may be presented or underrepresented; proficiency at communicating across disciplinary boundaries; and, throughout, probity and integrity. To achieve these goals, Sixth College is creating a learning environment inside and beyond the classroom that emphasizes collaborative learning, pattern recognition, close reasoning, and creative approaches to well-defined problems through consistent exposure to methods and models from diverse fields, including the expressive and kinetic arts. Sixth College will provide the tools and momentum necessary for lifelong learning in the twenty-first century: information literacy, familiarity with digital media, the habit of seeking out and learning from those at the forefront of their fields, and the equally valuable habit of pausing to reflect upon the wider ethical and cultural implications of new theories or discoveries.

On campus and off, students will be linked in many ways—by social and local engagement, by cultural and intellectual projects—so that Sixth College becomes an identifiable, sustaining community that is always reaching out to others. More than an ethical obligation to service, the engagement with the outlying community is integral to the mission of the college to engage our students in the process of learning to listen across cultures.

COURSES

LOWER-DIVISION

CAT 1. Culture, Art, and Technology 1 (4)
A global historical overview of principles and patterns of human development, with emphasis on technology and the arts. Traces causes and consequences of cultural variation. Explores interactions of regional environments (geographic, climatic, biological) with social and cultural forces. *Prerequisites: Sixth College students only; may be taken concurrently with SDCC 1.*

CAT 2. Culture, Art, and Technology 2 (6)
Fundamental shifts in one area of endeavor can have a profound impact on whole cultures. Examines select events, technologies, and works of art that revolutionized ways of inhabiting the world. Intensive instruction in university-level writing; featured sections on information literacy. *Prerequisites: completion of Subject A requirement; Sixth College students only.*

CAT 3. Culture, Art, and Technology 3 (6)
Students engage with various interdisciplinary modes of apprehending the near future. Working in teams on community projects, they are challenged to listen and communicate across cultures and develop cogent technological and artistic responses to local problems. Writing and information literacy instruction. *Prerequisites: completion of Subject A requirement; Sixth College students only.*

CAT 4. Culture, Art, and Technology 4 (2)
Students will work in project teams to explore the prudent and appropriate use of software applications to gather, process, shape, and communicate information. Topics may include critical examinations of computer-based technology, impact on privacy, ethical problems in computing, etc. *Prerequisites: Sixth College students only; lab attendance is not required.* Not offered 2004–2005.

Dimensions of Culture

OFFICE: 132 Sequoyah Hall, Marshall College
http://marshall.ucsd.edu/DOC

Program Director

Fraser Cocks, Ph.D.

Assistant Program Director

Pamela S. Wright, Ph.D.

The Dimensions of Culture Program is a three-course sequence taught by faculty from the Departments of History, Political Science, Communication, Ethnic Studies, Philosophy, Literature, Sociology, and the Teacher Education Program. This program provides an interdisciplinary issues-oriented exploration of nineteenth- and twentieth-century American culture, and illustrates Marshall College's commitment to exploring the meaning of social justice and investigating the means by which it might be achieved in contemporary American society.

The first quarter, Diversity, introduces students to the study of basic distinctions in social differences and commonalities among human individuals and groups. This course surveys a range of social differences and stratifications that shape the nature of human attachment to self, work, community, and a sense of nation. The second quarter, Justice, introduces basic concepts of political and social theory and moral philosophy. Readings are drawn from nineteenth- and twentieth-century American history and legal case studies. The third quarter, Imagination, introduces students to the study of the arts as the cultural expression of the issues presented in the first two quarters. Materials focus on the interdisciplinary study of twentieth-century American culture, including music, literature, art, film, and photography.

Written assignments are required in each quarter of the Dimensions of Culture sequence. In the second and third quarters, students receive intensive instruction in university-level writing in small sections. Frequent writing assignments and revisions are required in connection with the material presented in class. At the conclusion of the course, students are expected to be able to construct deductive arguments regarding contemporary social issues and inductive arguments interpreting cultural representations.

The Marshall College core course and writing requirements are met by completion of this sequence. Students must have satisfied the university's Subject A requirement before enrolling in Justice or Imagination. All Marshall College first-year students must complete this three-course sequence. Transfer students should see their college academic adviser regarding the appropriate course requirements.

For further details on Marshall College requirements, see "Marshall College, General-Education Requirements."

COURSES

LOWER-DIVISION

1. Dimensions of Culture: Diversity (4)
This course focuses on sociocultural diversity in examining class, ethnicity, race, gender, and sexuality as significant markers of differences among persons. Emphasizing American society, it explores the cultural understandings of diversity and its economic, moral, and political consequences. Three hours of lecture, one hour of discussion. Open to Marshall College students only. (Letter grade only.) (F)

2. Dimensions of Culture: Justice (6)
This course considers the nature of justice in philosophical, historical, and legal terms. Topics include racial justice, political representation, economic justice, gender and justice, the rights of cultural minorities, and crime and punishment. The course offers intensive instruction in writing university-level expository prose. Three hours of lecture, two hours of discussion and writing instruction. Open to Marshall College students only. (Letter grade only.) *Prerequisite: completion of Subject A requirement.* (W)

3. Dimensions of Culture: Imagination (6)
Using the arts, this course examines the evolution of pluralistic culture to the modern period. There is a special emphasis on the interdisciplinary study of twentieth-century American culture, including music, literature, art, film, and photography. The course offers intensive instruction in writing university-level expository prose. Three hours of lecture, two hours of discussion and writing instruction. Open to Marshall College students only. (Letter grade only.) *Prerequisite: completion of Subject A requirement.* (S)

Earth Sciences

OFFICE: Galbraith Hall, room 188
Revelle College

Professors

Jeffrey L. Bada, *Marine Chemistry*
Kevin M. Brown, *Geology*
Catherine G. Constable, *Geophysics*
Neal W. Driscoll, *Geosciences*
James W. Hawkins, *Geology*
Myrl C. Hendershott, *Oceanography*
Nicholas D. Holland, *Marine Biology*
Jeremy B. Jackson, *Paleontology*
Miriam Kastner, *Earth Sciences*
Devendra Lal, *Nuclear Geophysics*
J. Douglas Macdougall, *Earth Sciences*
T. Guy Masters, *Geophysics*
Jean-Bernard H. Minster, *Geophysics*
David T. Sandwell, *Marine Geophysics*
John G. Sclater, *Marine Geophysics*
Richard C.J. Somerville, *Meteorology*
Lisa Tauxe, *Geophysics, (Program Director)*
Mark Thiemens, *Chemistry*
Martin Wahlen, *Geochemistry*

Professors-in-Residence

Steven C. Constable, *Geophysics*
Jeffrey S. Gee, *Geophysics*

Associate Professors

Paterno R. Castillo, *Geology*
Christopher D. Charles, *Oceanography*
David R. Hilton, *Geochemistry*
Catherine L. Johnson, *Geophysics*
Kaustuv Roy, *Biology*
Jeffrey P. Severinghaus, *Geoscience*

Research Scientist/Senior Lecturer

Alistair J. Harding, *Research Geophysics*

The *UCSD Interdisciplinary Earth Sciences Undergraduate Program* offers an earth sciences major leading to a B.S. degree, with emphasis on the quantitative aspects of the field. As a guiding concept, the focus of the earth sciences curriculum is the physical and chemical evolution of the earth system and the energetics and dynamics of this evolution. The program takes advantage of the unique opportunities offered by UCSD, in particular through the Scripps Institution of Oceanography and the California Space Institute. The major can be complemented by various minors ranging from mathematics, physics or chemistry, to biology, environmental science, or public policy, and political science. Chemistry and physics majors may also specialize in earth sciences by taking a series of courses offered through this program (see the "Chemistry" and "Physics" sections of the catalog for details). In addition, the program offers a broad choice of courses, including general-education courses in the earth sciences and related topics from which to select a minor in the earth sciences.

The Undergraduate Earth Science Program was initiated in the fall of 1992, and most of the faculty are members of the Scripps Institution of Oceanography. Students, especially earth science majors, are encouraged to consult with these instructors about incorporating appropriate Scripps Institution of Oceanography courses into their programs.

Majors in Earth Sciences

Three tracks with slightly different course requirements are presently offered through the UCSD Interdisciplinary Earth Sciences Undergraduate Program. These are the General ERTH major, and the *ERTH/Chemistry* and *ERTH/Physics* majors.

Lower-division requirements are the same for all majors and are designed to provide the foundations in mathematics, physics, chemistry, and biology that are essential in modern quantitative earth sciences disciplines. In addition, three upper-division courses introducing the basic concepts of geology and geochemistry, ERTH 101, ERTH 102, and if schedule permits, ERTH 104, should be taken during the sophomore year to provide the appropriate background for other upper-division courses.

A grade-point average of 2.0 or higher in the upper-division major program is required for graduation. Students must receive a grade of C– or better in any course to be counted toward fulfillment of the major requirements. In exceptional cases, students with a grade-point average in the major of 2.5 or greater may petition to have one grade of D accepted. All courses (lower- and upper-division) required for the major must be taken for a letter grade.

Special Studies Courses

Special studies in the earth sciences are offered as the courses ERTH 198 and ERTH 199. These courses are subject to consent of the instructor and approval by the Earth Sciences faculty adviser. They are open to students who have accrued at least ninety quarter-units and have a GPA of at least 3.0. No more than two quarters of earth sciences special studies may be counted toward any earth sciences major.

Lower-Division Requirements (common for all earth science majors)

The following courses must be taken for a letter grade:

1. Mathematics 20A, 20B, 20C, 20D, or equivalent
2. Physics 2A, 2B, 2C
3. Chemistry 6A, 6B, 6C, 6BL
4. Biology 3 (BILD 3)

Note: Physics 2CL is a required prerequisite for various upper-division chemistry electives.

5. Earth Sciences courses which should be taken in the sophomore year:

   ERTH 101. Introduction to Earth and Environmental Science
   ERTH 102. Introduction to Geochemistry
   ERTH 104. Geobiology

A possible schedule yields:

FALL	WINTER	SPRING
FRESHMAN YEAR		
Chem. 6A	Chem. 6B	Chem. 6C
Math. 20A	Chem. 6BL	Math. 20C
	Math. 20B	
SOPHOMORE YEAR		
Phys. 2A	Phys. 2B	Phys. 2C
Math. 20D	ERTH 102	BILD 3
ERTH 101		

ERTH/Chemistry Major

This specialization focuses on the Earth as a chemical system, and on its evolution. Emphasis is placed on the fundamental observations that allow geoscientists to understand better the past history of the planet, the energetics of its evolution, and the major "cycles" (e.g., water, carbon) that characterize and control planetary-scale changes on a broad range of time scales. The major is appropriate for students interested in modern geochemistry, in "global change" studies, and in global and local environmental problems, including biochemical and anthropogenic effects.

Upper-Division Requirements

In addition to ERTH 101 and ERTH 102 (see lower-division requirements), the following courses must be taken for a letter grade:

1. Earth Sciences requirements:

   ERTH 103. Introduction to Geophysics
   ERTH 120. Mineralogy
   ERTH 162A. Introduction to Field Geology
   ERTH 162L. Structural Analysis for Field Geology

2. Chemistry requirements:

   Chemistry 120A. Inorganic Chemistry
   Chemistry 131. Physical Chemistry or Chemistry 127
   Chemistry 140A. Organic Chemistry

3. Chemistry restricted electives. (Total of sixteen units required), at least eight units from:

   Chemistry 140B-C. Organic Chemistry
   Chemistry 143A-B. Organic Chemistry Lab
   Chemistry 132-133. Physical Chemistry
   *Chemistry 105A-B. Physical Chemistry Lab
   Chemistry 106. Instrumental Analysis Lab

eight units from:
Chemistry 120B-C. Inorganic Chemistry
Chemistry 122. Biochemical Evolution
Chemistry 149A-B. Environmental Chemistry
Chemistry 170. Cosmochemistry
Chemistry 171. Nuclear Chemistry
Chemistry 173. Atmospheric Chemistry

4. Earth Sciences restricted electives: at least sixteen units selected from among the following courses must be passed with a 2.0 grade-point average and grades of C– or better:

ERTH 104. Geobiology
ERTH 105. Sedimentology and Stratigraphy
ERTH 110. Introduction to GIS for Earth and Environmental Scientists
ERTH 130. Geodynamics of Terrestrial Planets
ERTH 135. Satellite Remote Sensing
ERTH 142. Atmospheric Chemistry
ERTH 143. Marine Paleoecology
ERTH 144. Introduction to Isotope Geochemistry
ERTH 152. Petrology and Petrography
ERTH 155. Petrology and Geochemistry of the Solid Earth
ERTH 160. Introduction to Tectonics
ERTH 197. Earth Science Internship
SIO 226. Introduction to Marine Geophysics
SIO 240. Marine Geology
SIO 247. Rock Magnetism and Paleomagnetism
SIO 260. Marine Chemistry

Students may wish to incorporate a small portion of the major program into their lower-division course load, for example, Chemistry 120A, Chemistry 140A.

* Requires prerequisite other than earth science requirements.

A possible schedule yields:

FALL	WINTER	SPRING
JUNIOR YEAR		
Chem. 140A	Chem. Elect.	ERTH Elect.
Chem. 120A	Chem. Elect.	ERTH Elect.
ERTH 103	ERTH 120	Chem. Elect.
SENIOR YEAR		
ERTH Elect.	Chem. 131	ERTH Elect.
ERTH 162A		Chem. Elect.
ERTH 162L		

ERTH/Physics Major

This specialization focuses on the mechanical, dynamical, and thermodynamical aspects of the Earth. Emphasis is placed on a solid background of fundamental physics, from mechanics and electromagnetism to continuum- and quantum mechanics, and on the necessary mathematical skills. The major introduces basic techniques used to investigate the internal structure of the Earth, from seismology to the study of potential fields, and space geodesy. Elementary geodynamics, including the physics of simple convective systems, introductory rock mechanics, and plate kinematics are among topics introduced. At the same time, a "hands on" exposure to field problems and techniques will be accessible through a Natural Resources and Field Geophysics sequence.

Upper-Division Requirements

In addition to ERTH 101 and ERTH 102 (see lower-division requirement), the following courses must be taken for a letter grade:

1. Earth Sciences requirements:

ERTH 103. Introduction to Geophysics

2. Physics requirements:

Physics 100A-B-C. Electromagnetism
Physics 110A-B. Mechanics

3. Physics restricted electives: minimum of four units selected from:

Physics 121. Experimental Techniques
Physics 140A-B. Statistical and Thermal Physics
Physics 105. Computational Physics
MAE 131A. Solid Mechanics I
MAE 180A. Space Science and Engineering

4. Mathematics restricted electives: minimum of eight units selected from:
Mathematics 110. Partial Differential Equations or equivalent
Mathematics 102. Linear Algebra or equivalent
Mathematics 120A-B. Complex Analysis or equivalent
Mathematics 183. Statistical Methods or equivalent

5. Earth Sciences restricted electives: at least sixteen units selected from among the following courses must be passed with a 2.0 grade-point average and grades of C– or better:

ERTH 104. Geobiology
ERTH 105. Sedimentology and Stratigraphy
ERTH 120. Mineralogy
ERTH 130. Geodynamics of Terrestrial Planets
ERTH 135. Satellite Remote Sensing
ERTH 143. Marine Paleoecology
ERTH 155. Petrology and Geochemistry of the Solid Earth
ERTH 160. Introduction to Tectonics
ERTH 162A. Introduction to Field Geology
ERTH 162L. Structural Analysis for Field Geology
ERTH 170. Introduction to Volcanology (summer session)
ERTH 180. Geophysics of Natural Resources
ERTH 182. Field Geophysics
ERTH 197. Earth Science Internship
SIO 223. Geophysical Data Analysis
SIO 224. Physics of the Earth Interior
SIO 226. Introduction to Marine Geophysics
SIO 227. Advanced Seismology
SIO 247. Rock Magnetism & Paleomagnetism

Students may wish to incorporate a small portion of the major program into their lower-division course load, for example, Physics 105, Mathematics 110, or equivalent. Students intending to do graduate work in geophysics are encouraged to take the Physics 4 sequence rather than the Physics 2 sequence. Students are also strongly encouraged to participate in a field geology course.

An example schedule is outlined below.

FALL	WINTER	SPRING
JUNIOR YEAR		
Phys. 100A	Phys. 100B	Phys. 100C
Phys. 110A	Phys. 110B	Math. Elect.
ERTH 103	—	—
SENIOR YEAR		
—	Phys. Elect.	ERTH Elect.
Math. Elect.	—	—
ERTH Elect.	ERTH Elect.	ERTH Elect.

ERTH/General

The general ERTH major is designed to allow students maximum flexibility in tailoring the curriculum to their interests, within the constraints of obtaining the necessary background in physical, biological, and earth sciences. Compared to the ERTH/Chemistry and ERTH/Physics tracks, it

requires more earth science and fewer non-earth science courses.

Upper-Division Requirements

In addition to ERTH 101 and ERTH 102 (see lower-division requirements), the following courses must be taken for a letter grade:

1. Earth Sciences requirements:

   ERTH 103. Introduction to Geophysics
   ERTH 104. Geobiology
   ERTH 120. Mineralogy
   ERTH 152. Petrology and Petrography
   ERTH 160. Introduction to Tectonics
   ERTH 162A. Introduction to Field Geology
   ERTH 162L. Structural Analysis for Field Geology
   ERTH 180. Geophysics of Natural Resources
   ERTH 182. Field Geophysics

2. Chemistry requirements:

   Chemistry 131. Physical Chemistry or Chemistry 127

3. Upper-division restricted electives: at least eight units from earth sciences and at least twelve units from non-earth science courses.

   ERTH 105. Sedimentology and Stratigraphy
   ERTH 130. Geodynamics of Terrestrial Planets
   ERTH 135. Satellite Remote Sensing
   ERTH 142. Atmospheric Chemistry
   ERTH 143. Marine Paleoecology
   ERTH 144. Introduction to Isotope Geochemistry
   ERTH 197. Earth Science Internship
   ERTH 155. Petrology and Geochemistry of the Solid Earth
   SIO 223. Geophysical Data Analysis
   SIO 224. Physics of the Earth Interior
   SIO 226. Introduction to Marine Geophysics
   SIO 227A. Advanced Seismology
   SIO 234. Introduction to Geodynamics
   SIO 240. Marine Geology
   SIO 242. Controversies in Geomorphology
   SIO 245A. Interpretation of the Sedimentary Record
   SIO 247. Rock Magnetism & Paleomagnetism
   SIO 249. Hydrogeological Modeling
   SIO 253. Igneous and Metamorphic Petrology
   SIO 260. Marine Chemistry
   MAE 131A. Solid Mechanics
   MAE 180A. Space Science and Engineering
   BIBC 100. Structural Biochemistry
   BIEB 120. General Ecology
   BIBC 130. Marine Biochemistry
   BIEB 130. Introductory Marine Ecology
   BIEB 150. Evolution
   Chemistry 105A-B. Physical Chemistry Lab
   Chemistry 120A-B-C. Inorganic Chemistry
   Chemistry 122. Biochemical Evolution
   Chemistry 132-133. Physical Chemistry
   Chemistry 140A-B-C. Organic Chemistry
   Chemistry 143A-B. Organic Chemistry Lab
   Chemistry 149A-B. Environmental Geochemistry
   Chemistry 170. Cosmochemistry
   Chemistry 171. Nuclear and Radiochemistry
   Chemistry 173. Atmospheric Chemistry
   Mathematics 102. Linear Algebra
   Mathematics 110. Partial Differential Equations or equivalent
   Mathematics 120A-B. Complex Analysis
   Mathematics 183. Statistical Methods
   Physics 100A-B-C. Electromagnetism
   Physics 105. Computational Physics
   Physics 110A-B. Mechanics
   Physics 121. Experimental Techniques
   Physics 140A-B. Statistical and Thermal Physics

A possible schedule yields :

FALL	WINTER	SPRING
FRESHMAN YEAR		
Chem. 6A	Chem. 6B	Chem. 6C
Math. 20A	Chem. 6BL	Math. 20C
	Math. 20B	
SOPHOMORE YEAR		
Phys. 2A	Phys. 2B	Phys. 2C
Math. 20D	ERTH 102	BILD 3
ERTH 101		ERTH 104
JUNIOR YEAR		
Chem. 131	ERTH 120	—
ERTH 103	Elect.	ERTH 152
	Elect.	ERTH 160
SENIOR YEAR		
Elect.	Elect.	ERTH 180
ERTH 162A	Elect.	ERTH 182
ERTH 162L		

Earth Sciences Minor

A minor in earth sciences consists of twenty-eight units of earth science courses, at least twenty of which must be upper-division, focused on geology, geochemistry, or geophysics. Courses required by a student's major may not be applied toward a minor and neither can ERTH 198 nor ERTH 199. Courses for the minor may be taken on a Pass/Not Pass basis if the student's college permits.

Honors Program

The Earth Sciences Program offers an Honors Program for a limited number of students who have demonstrated excellence in the major. Students are eligible for admission to the program when they have:

1. Completed ninety units of courses including twelve units of earth science courses.
2. Achieved a GPA of 3.3 overall and 3.5 in earth science courses.
3. Submitted to the Earth Science Steering Committee, and had approved, an honors thesis research proposal.

Successful completion of the Honors Program requires:

1. Maintenance of a GPA of 3.3 overall and 3.5 in earth science courses.
2. Completion, with a B grade or higher, of a minimum of eight units of ERTH 196 related to the honors thesis research, distributed over at least two quarters. These units must be in addition to the ordinary major requirements. However, students who subsequently fail to complete the Honors Program may apply up to four of these 196 units to their major.
3. Acceptance of a written honors thesis report by a committee of not fewer than three faculty members.
4. Satisfactory presentation of an oral report on the thesis research, preferably at a public undergraduate research conference on campus, or at an earth science conference. Alternatively, the oral report may be given at a seminar involving honors students and at least three faculty members.

Students who successfully complete the Honors Program will graduate with "high distinction."

Students who are interested in the Honors Program should contact the program adviser in Galbraith Hall, room 188, Revelle College.

Study Abroad

Study abroad through the **Education Abroad Program** or **Opportunities Abroad Program** can enhance a student's major, particularly as an opportunity for diverse field experiences. How-ever, careful planning is important to meet all major requirements. Please contact the Earth

Sciences Office as early as possible if you are planning to study abroad.

Careers in Education

Students interested in a teaching career should be aware that the earth sciences major, because of its broad course requirements in the sciences, fulfills many of the subject requirements for obtaining a California Teaching Credential through UCSD's Teacher Education Program (TEP). The projected high demand over the next decade for well-trained teachers, particularly in the sciences, makes this an attractive option for many students. Students who wish to take advantage of this opportunity may wish to complete a minor in education. Please contact the TEP office directly for further details.

Contiguous Bachelor's/ Master's Degree Program

The integrated program leading to a bachelor of science and a master of science degree in Earth Sciences is offered to undergraduate students who are enrolled in the Earth Sciences major, and to qualified students who are completing a specialization or minor in Earth Sciences. It is open only to UCSD undergraduates, and entails participation in research in an area of the earth sciences to be determined jointly by the student and a committee of faculty members from the Earth Sciences Program. Applications will only be accepted during the final quarter of the applicant's junior year, or the first or second quarter of the senior year. A minimum undergraduate GPA of 3.0 overall and 3.3 in upper-division Earth Sciences courses is required for admission. Applications must include a written statement of purpose, a summary of the research proposal, and a letter of support from the potential M.S. thesis adviser. Students must complete requirements for the B.S. degree before they are enrolled in the M.S. program, and are expected to meet the requirements for the M.S. degree within three consecutive academic quarters after obtaining the B.S. Students may be dropped from the program if breaks in enrollment occur. The Earth Sciences Program does not have financial aid available for students enrolled in the program. Please contact the Earth Sciences Office in Galbraith Hall, room 188, Revelle College for information.

Earth Sciences Graduate Program

Other graduate degrees in the earth sciences are offered through the graduate department of the Scripps Institution of Oceanography. See listings under "Scripps Institution of Oceanography" for detailed information.

COURSES

NOTE: The program will endeavor to offer the courses outlined below. However, unforeseen circumstances (particularly changes in ship schedules) sometimes mandate a change of scheduled offerings, especially the quarter offered (F,W,S). Students are strongly advised to check the Schedule of Classes or to contact the Earth Sciences Program Office (Galbraith Hall, room 188, Revelle College, (858) 534-8157) to obtain up-to-date information.

LOWER-DIVISION

ERTH 1. The Planets
Space exploration has revealed an astonishing diversity among the planets and moons in our solar system. The planets and their histories will be compared to gain insight and a new perspective on planet Earth. *Prerequisite: none.* (S)

ERTH 10. The Earth (4)
A basic introduction to geology for students with little previous science background. The course stresses understanding of the concepts of the structure of the Earth and the processes which have formed it and continue to modify it. The course emphasizes material which every educated citizen should know for appreciation and enjoyment of the world around us, for understanding geological events as reported in the news, and for participating in making intelligent decisions regarding the future of our environment. Three-hour lecture plus optional local field trips. *Prerequisite: none.* (W)

ERTH 12. History of the Earth and Evolution (4)
Evolution of the Earth from its origin in the early solar system to formation of continents and ocean basins, and how the planet became habitable. It examines the geologic record of evolution, extinction, plate tectonics, and climate changes through time. Three-hour lecture. *Prerequisite: none.* (S)

ERTH 15. Natural Disasters
An introduction to environmental perils and their impact on everyday life. Geological and meteorological processes are explored, including earthquakes, volcanic activity, large storms, global climate change, mass extinctions throughout Earth's history, and human activity that causes and prevents natural disasters. *Prerequisite: none.* (F)

ERTH 20. The Atmosphere (4)
Descriptive introduction to meteorology and climate studies. Topics include global and continental wind and precipitation patterns, weather forecasting, present climate and past climate changes (including droughts, El Ni–o events), man-made modification of climate, including CO_2 and other "greenhouse" gases effects, ozone destruction, "little ice ages," acid rain. Three-hour lecture. *Prerequisites: some high school physics and chemistry background recommended.* (W)

ERTH 30. The Oceans (4)
Presents modern ideas and descriptions of the physical, chemical, biological, and geological aspects of oceanography, and considers the interactions between these aspects. Intended for students interested in the oceans, but who do not necessarily intend to become professional scientists. Three-hour lecture, one-hour discussion. *Prerequisite: some background in high school chemistry recommended.* (F)

ERTH 35. Water (4)
This course will examine the properties of water that make it unique and vital to living things. Origin of water on Earth and neighboring planets will be explored. Socially relevant issues concerning water use and contamination will be covered. *Prerequisite: none.* (S)

ERTH 96. Frontiers in the Earth Sciences (2)
An introduction to current research in the earth sciences. Background in science not required, but may be useful for some topics. Areas covered vary from year to year. (S)

UPPER-DIVISION

ERTH 101. Introduction to Earth and Environmental Science (5)
This course is an introduction to how our planet works, focusing on the formation and evolution of the solid earth, and the processes affecting both its surface and interior. Laboratories and field trips complement and extend the lecture material. *Prerequisites: one year each of college-level math, and chemistry, or consent of instructor.* (F)

ERTH 102. Introduction to Geochemistry (4)
A broad introduction to the chemical composition and evolution of the Earth and the solar system. This course explores applications of chemical methods to elucidate the origin and geologic history of the Earth and the planets, the evolution of the oceans and atmosphere, and the impact of humankind on the environment. *Prerequisites: ERTH 101, Chemistry 6A-B-C or equivalent, first-year, mathematics, and physics, or consent of instructor.* (W)

ERTH 103. Introduction to Geophysics (4)
An introduction to the structure and composition of the solid earth. Topics include seismology, the gravity and magnetic fields, high-pressure geophysics, and concepts in geodynamics. Emphasis is on global geophysics, i.e., on the structure and evolution of the planet. *Prerequisites: Math. 20A-B-C-D and Physics 2 sequence or equivalent, ERTH 101, or consent of instructor. ERTH 160 recommended.* (F)

ERTH 104. Geobiology (5)
Introduction to the major biological transitions in earth history from the origins of metabolism and cells to the evolution of complex societies. The nature and limitations of the fossil record, patterns of adaptation and diversity, and the tempo and mode of biological and environmental change. Laboratories and field trips complement and extend the lecture material. *Prerequisites: ERTH 101, BILD 3 or equivalent, or consent of instructor.* (S)

ERTH 105. Sedimentology and Stratigraphy (4)
This course will examine sedimentary environments from the mountain tops to the deep sea across a variety of time scales. The focus will be to understand how depositional processes form the stratigraphic record. The central goal of the course is to develop the skills to interpret stratigraphy and read the history of the earth that it records. *Prerequisite: Erth 101.* (F)

ERTH 110. Introduction to GIS for Earth and Environmental Scientists (4)
A hands-on introduction to geological and environmental applications of geographic information systems (GIS). Students acquire data through field surveys and digitization, design and construct GIS using ESRI's ArcGIS software, analyze spatial data, and present the finished products as maps. Prerequisites: ERTH 101 or ESYS 102 or the equivalent, or consent of instructor. (S)

ERTH 120. Introduction to Mineralogy (4)
This course focuses on the symmetry, crystal structure, chemical, and physical properties of minerals with special emphasis on the common rock-forming minerals, and highlights the applications of mineralogical and X-ray crystallographic techniques to a spectrum of important problems in the earth sciences. The laboratory will introduce the students to the polarizing microscope and X-ray powder diffraction methods for the study of rock-forming minerals. *Prerequisites: ERTH 101, ERTH 102 (may be taken concurrently with ERTH 102).* (W)

ERTH 130. Geodynamics of Terrestrial Planets (4)
Planetary differentiation through geodynamical processes is the fundamental agent controlling the evolution of the planet on geological time scales. Similarities and differences between the Earth, Venus, Mars, and other terrestrial planets and satellites teach us about the processes which shape a planet's formation and evolution. The course includes a computer-oriented lab. *Prerequisites: Math. 20A-B-C-D and Physics 2 sequence, or consent of instructors.* (S)

ERTH 135. Satellite Remote Sensing (4)
Satellite remote sensing provides global observations of Earth to monitor changes in the environment of land, oceans, and ice. This course is an overview of the physical principles of remote sensing including orbits, electromagnetic radiation, diffraction, electro-optical, and microwave systems. Prerequisites: Physics 2A-B or Physics 4A-B-C. (W)

ERTH 142. Atmospheric Chemistry and the Biochemical Cycles of Atmospheric Trace Gases (4)
Evolution of the Earth's atmosphere, from the earliest days of the planet to the present, and into the future. The atmospheres of other terrestrial planets are discussed to provide a planetary perspective. Discussions will include effects of "greenhouse" gases such as H_2O, CO_2, and CH_4 in climate modification, and other influences of civilization's byproducts on atmospheric chemistry, e.g., the destruction of the ozone layer. The biogeochemical cycles of the radioactively important trace gases will be examined. *Prerequisites: Chemistry 6 sequence or equivalent.* Offered in alternate years (offered winter 2004). SIO staff. (W)

ERTH 143. Marine Paleoecology (4)
Paleoecology of marine plankton, nekton, and benthos. Patterns and changes in marine communities and ecosystems over geological time in relation to changes in the physical, chemical, and geological environment and biotic interactions. The preservation filter and inference of ecological processes from fossils and biogeochemical proxies. Biotic interchanges, incumbency, escalation and trends, mass extinctions, and recovery. Lectures, seminar discussion, and field trips. *Prerequisites: Bachelor's degree in science or consent of instructor; open to undergraduates with completion of ERTH 104 and either BIEB 130 or BIEB 140 or equivalent.* (S)

ERTH 144. Introduction to Isotope Geochemistry (4)
Isotopic ratios of various elements serve as natural tracers, as chronometers, and as geothermometers. Thus isotope measurements have become an indispensable tool for earth scientists. This course introduces students to the theory of radioactivity, geochronology, and stable isotope fractionation and shows how these principles are used to investigate important geochemical problems. *Prerequisites: ERTH 101, ERTH 102, ERTH 120.* (F)

ERTH 150. Environmental Perils (4)
An advanced field-oriented course for engineering and science students stressing the geologic basis for environmental perils such as earthquakes, erosion flooding, and waste disposal. Two one-hour lectures and a two-hour lab/field trip each week. One Saturday field trip. *Prerequisites: Math. 20A-B-C-D, sequence and Physics 2A-B-C sequence or equivalent.* (S)

ERTH 152. Petrology and Petrography (4)
Mineralogic, chemical, textural, and structural properties of igneous, metamorphic, and sedimentary rocks; their origin and relations to evolution of the Earth's crust and mantle. Includes rocks of both the continents and ocean basins. The laboratory emphasizes both hand specimens and microscopic studies of rocks in thin sections. *Prerequisites: ERTH 101, ERTH 102, and ERTH 120 or their equivalents.* (S)

ERTH 155. Petrology and Geochemistry of the Solid Earth (4)
This course provides an overview of the Earth from a geochemical and petrogenetic point of view. Topics include the formation and chemical differentiation of material in the solar system, the formation and differentiation of the Earth into core, mantle, crust and atmosphere/hydrosphere, the generation of magma in a variety of plate tectonic settings, and isotope and trace element geochemistry of igneous and metamorphic rocks. Literature readings will be assigned for most topics and discussion is expected of everyone. *Prerequisite: ERTH 152 or consent of instructors.* (W)

ERTH 160. Introduction to Tectonics (4)
The theory of plate tectonics attempts to explain how forces within the earth give rise to continents, ocean basins, mountain ranges, earthquake belts and most volcanoes. In this course we will learn how plate tectonics works. *Prerequisites: ERTH 101 or consent of instructor.* (F)

ERTH 162A. Introduction to Field Geology (4)
Mapping and interpretation of geologic units and structures in the field. Field observations at the surface are related to theory and extrapolated to three dimensions. Field work is done on weekends in local areas; field data are discussed and evaluated through applicable geologic principles in the laboratory. *Prerequisites: ERTH 101, ERTH 120 or consent of instructor. To be taken concurrently with ERTH 162L.* (F)

ERTH 162L. Structural Analysis for Field Geology (4)
Principles of stratigraphy and structural geology applicable to field geologic studies. Discussion and laboratory exercises. *Prerequisites: ERTH 101, ERTH 120, or consent of instructor. To be taken concurrently with ERTH 162A.* (F)

ERTH 170. Introduction to Volcanology (4)
This course teaches fundamental aspects of physical and chemical volcanology with a major field study component on an active volcano on Hawaii. Subjects are introduced in lectures and reinforced and expanded in field exercises. Prerequisites: ERTH 101, Chem. 6A, upper-division standing or consent of instructor; eighteen years or older and ability to walk up to fifteen miles a day over rough terrain. (Offered summer session only)

ERTH 180. Geophysics of Natural Resources (4)
Introduction to seismic, gravity, magnetic, and electrical methods used in exploration geophysics on scales of hundreds of kilometers to tens of meters. These are the principal means of discovering energy and mineral resources such as oil, gas, and ore deposits. Emphasis is on the underlying physical principles of the methods, instrumentation, and data interpretation. *Prerequisites: Math. 20A-B-C-D and Physics 2 sequence. ERTH 182 must be taken concurrently.* (S)

ERTH 182. Field Geophysics (4)
Introduction to design and execution of simple geophysical field experiments, including seismic, gravimetric, geoelectrical, and geodetic techniques. The focus is on a simple geological problem that can be solved by geophysical experiments. Computer-aided data analysis and interpretation. *Prerequisites: ERTH 180 (must be taken concurrently) or consent of instructor.* (S)

ERTH 190. Special Topics in Earth Sciences (2-4)
A seminar course designed to treat emerging or topical subjects in the earth sciences. Involved reading from the literature and student participation in discussion. Topics vary from year to year.

ERTH 194. Research Seminar in Washington, D.C. (4)
Course attached to six-unit internship taken by students participating in the UCDC program. Involves weekly seminar meetings with faculty and teaching assistant and substantial research paper. *Prerequisites: departmental approval. Participating in UCDC Program.*

ERTH 196. Honors Thesis Research (4)
Independent reading or research on a problem. By special arrangement with a faculty member. (Letter grade only.)

ERTH 197. Earth Science Internship (2-4)
The Earth Science Internship program is designed to complement the program's academic curriculum with practical field experience. *Prerequisites: consent of instructor, upper-division standing, minimum GPA of 2.0, department stamp.*

ERTH 198. Directed Group Study (2-4)
This course covers a variety of directed group studies in areas not covered by formal ERTH courses (P/NP grades only.) *Prerequisite: consent of instructor.*

ERTH 199. Independent Study for Undergraduates (4)
Independent reading or research on a problem. By special arrangement with a faculty member. (P/NP grades only.)

ERTH 211. Research Seminar (2)
A three quarter required sequence for BS/MS Earth Sciences students to prepare students for thesis writing. (F,W,S)

Economics

ECONOMICS STUDENT SERVICES:
245 Sequoyah Hall
http://www.econ.ucsd.edu

Professors

Richard E. Attiyeh, Ph.D.
Eli Berman, Ph.D.
Julian Betts, Ph.D.
Richard T. Carson, Ph.D., *Chair*
John Conlisk, Ph.D., *Emeritus*
Vincent P. Crawford, Ph.D.
Wouter J. Den Haan, Ph.D.
Graham Elliott, Ph.D.
Roger H. Gordon, Ph.D.
Theodore Groves, Ph.D.
James D. Hamilton, Ph.D.
Gordon Hanson, Ph.D.
Mark J. Machina, Ph.D.
Ramachandra Ramanathan, Ph.D., *Emeritus*
Garey Ramey, Ph.D.
Valerie A. Ramey, Ph.D.
James E. Rauch, Ph.D.
Joel Sobel, Ph.D.
Ross M. Starr, Ph.D.
Allan Timmermann, Ph.D.
Joel Watson, Ph.D.
Halbert L. White, Ph.D.
Michelle J. White, Ph.D.

Research Professor

Robert F. Engle, Ph.D.
Clive W.J. Granger, Ph.D.
Harry M. Markowitz, Ph.D.

Associate Professors

Marjorie Flavin, Ph.D.
Dennis E. Smallwood, Ph.D., *Emeritus*

Assistant Professors

Kate Antonovics, Ph.D.
C. Hoyt Bleakley, Ph.D.
Julie Cullen, Ph.D.
Nora Gordon, Ph.D.
Silke Januszewski, Ph.D.
Marc Muendler, Ph.D.
Michael Noel, Ph.D.
Wolfram Schlenker, Ph.D.
Yixiao Sun, Ph.D.

Adjunct Professor

Dale Squires, Ph.D. *(NMFS)*

Associated Faculty

Nathaniel Beck, Ph.D. *(Professor, Political Science)*
Michael Bernstein, Ph.D. *(Professor, History)*
Takeo Hoshi, Ph.D. *(Professor, IR/PS)*
Alex Kane, Ph.D. *(Professor, IR/PS)*
Bruce Lehmann, Ph.D. *(Professor, IR/PS)*
Dimitrus Politis, Ph.D. *(Professor, Mathematics)*
Jeffrey Vincent, Ph.D. *(Professor, IR/PS)*

Introduction

Economics is the study of how individuals, organizations, and societies deal with scarcity—the fact that resources are not sufficient to satisfy everyone's wants. Because scarcity requires choice among alternative uses of resources, economists study both the technology by which resources are turned into the products people want and the preferences through which people choose among alternatives. Further, since society is composed of many individuals and groups, economists study markets, governments, and other institutions through which a society might gain the advantages of cooperation and resolve the conflicts due to competing goals. The economics curriculum develops tools and uses them to analyze a wide range of societal problems, and also to study the role of the government in solving these problems.

Economics is a different discipline from business administration. However, there are substantial overlaps. Both disciplines study the behavior of people and firms within the context of market, legal, and other institutions. In evaluating economic institutions, economists tend to emphasize the viewpoint of the larger society, and business scholars tend to emphasize the viewpoint of firms. A more complete discussion is available in the department *Undergraduate Handbook*, which contains a comparison between the economics major at UCSD and a business administration major at UC Berkeley.

The department *Undergraduate Handbook* is available on the Internet at the department Web site at http://www.econ.ucsd.edu/ugradprog. The handbook contains answers to frequently asked questions, gives practical tips for avoiding problems, and provides a more detailed discussion of the department's majors than is possible in the general catalog. It is important for students contemplating a major in the department to be familiar with the handbook and the prerequisite requirements listed therein. Time-sensitive information, job and internship announcements, and other important information are sent to all declared majors and minors through campus email.

Students interested in the Education Abroad Program (EAP) are encouraged to check out the brochure "Opportunities in Business and Economics" that is available at the EAP office.

The Undergraduate Program

Lower-Division Economic Courses

MICROECONOMICS AND MACROECONOMICS—ECONOMICS 1-2-3

The department offers three lower-division economics classes, Economics 1-2-3. Economics 1 introduces microeconomics: supply and demand, markets, income distribution, perfect and imperfect competition, and the role of government. Modern economics is somewhat mathematical, and calculus is the standard working tool. Economics 2, therefore, introduces basic mathematical concepts used in conjunction with basic micro and macro principles to expose students to standard tools of economic analysis: mathematical foundations of marginal analysis, basics of graphical, algebraic and statistical modeling, policy analysis, discounting, and strategic interaction. Economics 3 introduces macroeconomics: unemployment, inflation, business cycles, and monetary and fiscal policy.

The courses are to be taken in sequential order.

Accounting Course

The department offers an accounting course, Economics 4. Economics 4 is a lower-division requirement for the B.S. in management science and the management science minor. The course is a prerequisite for Economics 173, Corporate Finance. Economics 4 can be used as an optional part of an economics major or minor; and the course is open to students who take no other courses from the department.

Upper-Division Economics Courses

The upper-division economics core courses are offered according to the following academic schedule:

Fall—100A, 110A, 120A-B-C, 170A, 171, 172A, and 172C;

Winter—100A-B, 110A-B, 120A-B-C, 170A-B, and 172A-B;

Spring—100B, 110B, 120A-B-C, 170B, 171, and 172B-C.

The 100, 110, 120 and 170 core courses are sequential. That is, "A" must be taken before "B" before "C". Economics 172A must be taken first, but 172B and 172C may be taken in either order or concurrently.

Entry to the Majors

Any student in good standing may declare a major in the department by filling out a form at the Office of the Registrar. The major codes are as follows: Economics, EN 25; Management Science, EN 26; and Joint Mathematics-Economics, EN 28.

The Economics Major (B.A.)

The economics B.A. program is designed to provide a broad understanding of resource-allocation and income-determination mechanisms. Both the development of the tools of economic analysis and their application to contemporary problems and public policy are stressed.

A student majoring in economics must meet the following requirements:

1. Calculus. Mathematics 10A-B-C or Mathematics 20A-B and 20C/21C.
2. Lower-division economics. Economics 1-2-3.
3. Upper-division core. Economics 100A-B (microeconomics), Economics 110A-B (macroeconomics), and Economics 120A-B-C (econometrics).
4. Upper-division electives. Five more economics courses at the upper-division level.

Majors are strongly encouraged to complete the lower-division requirements (1 and 2) before beginning the upper-division requirements (3 and 4). Further, majors are strongly encouraged to take Economics 100A-B and either 110A-B or 120A-B-C prior to the senior year, since numerous upper-division electives have core-course prerequisites.

The following schedule, though not the only possibility, is a well-constructed one for majoring in economics.

FRESHMAN YEAR
Economics 1-2-3
Mathematics 10A-B-C or
Mathematics 20A-B and 20C/21C

SOPHOMORE YEAR
Economics 100A-B
Economics 120A-B-C

JUNIOR YEAR
Economics 110A-B
Economics Electives

SENIOR YEAR
Remaining Economics Electives

A detailed description of the economics major is contained in the *Undergraduate Handbook*, available in the Undergraduate Program section of the department Web site.

The Management Science Major (B.Sc.)

Management science builds on a set of related quantitative methods commonly used to solve problems arising in the private (business and finance) and public (government) sectors. While students will gain some familiarity with the traditional functional fields of business management, this program is more tightly focused and more quantitative than a traditional business administration major. It is not, however, a program in applied mathematics or operational research, since the economic interpretation and application of the tools are continually stressed. Rather, it is a quantitative major in applied economics with a management focus. Before beginning upper-division work, a major must complete Economics 1-2-3, Mathematics 20A-B and 20C/21C, and Mathematics 20F. These courses provide both the understanding of basic principles and the mathematical maturity needed to understand the quantitative techniques of management science.

The management science major requires a total of 15 upper-division courses. Nine of these are specified: Economics 170A-B (Management Science Microeconomics), Economics 120A-B-C (Econometrics), Economics 171 (Decisions Under Uncertainty), and Economics 172A-B-C (Introduction to Operations Research). The 170 sequence concerns the nature and interdependence of managerial resource allocation decisions. Economics 120A-B-C teaches the theory and use of statistics and econometrics. The 172 sequence provides a general survey of optimization and problem-solving techniques employed by management scientists.

Of the six management science electives, three from the following "restricted" list must be taken: Economics 109 (Game Theory), Economics 121 (Applied Econometrics), Economics 125 (Economics of Population Growth), Economics 173 (Corporate Finance), Economics 174 (Insurance, Economics, and Finance), Economics 175 (Financial Investments), Economics 176 (Marketing), Economics 178 (Economic and Business Forecasting), or Economics 179 (Decisions in the Public Sector). At least one restricted elective must be either Economics 173 or 175. Each of these courses focuses on an important set of managerial problems. The remaining three electives may be chosen from among other upper-division economics courses.. Each of these courses focuses on an important set of managerial problems. The remaining three electives may be chosen from among other upper-division economics courses.

The following schedule, though not the only possibility, is a well-constructed one for a student majoring in Management Science.

FRESHMAN YEAR
Economics 1-2-3
Mathematics 20A-B and 20C/21C

SOPHOMORE YEAR
Economics 120A-B-C
Economics 170A-B
Mathematics 20F

JUNIOR YEAR
Economics 4 (taken in quarter prior to Econ 173)
Economics 171
Economics 172A-B-C
Economics Electives

SENIOR YEAR
Remaining Economics Electives

A detailed description of the management science major is contained in the *Undergraduate Handbook*, available on the department Web site.

Joint Major in Mathematics and Economics (B.A.)

Majors in mathematics and the natural sciences often feel the need for a more formal introduction to issues involving business applications of science and mathematics. Extending their studies into economics provides this application and can provide a bridge to successful

careers or advanced study. Majors in economics generally recognize the importance of mathematics to their discipline. Undergraduate students who plan to pursue doctoral study in economics or business need the more advanced mathematics training prescribed in this major.

This major is considered to be excellent preparation for Ph.D. study in economics and business administration, as well as for graduate studies for professional management degrees, including the MBA. The major provides a formal framework making it easier to combine study in the two fields.

Course requirements of the Joint Major in Mathematics and Economics consist principally of the required courses of the mathematics major and the economics/management science majors:

Lower-Division Requirements:

1. Calculus and Linear Algebra. Mathematics 20A-B, 20C/21C, 20D, and 20F
2. Introductory Economics. Economics 1-2-3

Upper-Division Requirements:

Fifteen upper-division courses in mathematics and economics, with a minimum of seven courses in each department, chosen from the courses listed below (prerequisites are strictly enforced):

1. Mathematical Reasoning. Mathematics 109 (formerly Math. 89)
2. One of the following:
   a. Applied Linear Algebra. Mathematics 102
   b. Numerical Linear Algebra. Mathematics 170A
   c. Linear Algebra. Mathematics 100A and B
3. One of the following:
   a. Foundations of Analysis. Mathematics 140A
   b. Advanced Calculus. Mathematics 142A
4. One of the following:
   a. Ordinary Differential Equations. Mathematics 130A
   b. Foundations of Analysis. Mathematics 140B
   c. Advanced Calculus. Mathematics 142B
5. One of the following:
   a. Microeconomics. Economics 100AB
   b. Management Science Microeconomics. Economics 170AB
6. Econometrics/Statistics. One of the following:
   a. Economics 120A-B-C
   b. Mathematics 180A and Economics 120B-C
   c. Mathematics 180A and 181A and Economics 120C
7. One of the following:
   a. Macroeconomics. Economics 110AB
   b. Mathematical Programming: Numerical Optimization. Mathematics 171AB

   or

   Two of the following:
   a. Decisions Under Uncertainty. Economics 171
   b. Introduction to Operations Research. Economics 172A-B-C (**Note**: 172A is a prerequisite for 172B and C)

Other courses which are strongly recommended are: Mathematics 130B, 131, 181B, 190, and 193A-B and Economics 109, 113,175, and 178.

Further information may be obtained in the mathematics and economics undergraduate offices.

Honors

Currently, honors programs exist for the economics major and for the management science major. There are two levels of honors. For the lower level, indicated by the phrase "with distinction" on the diploma, you must satisfy the first two of the following three requirements. For the higher level, indicated by the phrase "with highest distinction" on the diploma, you must satisfy all three requirements. There is no application to the honors program. Register for either major under the regular major code (EN25 for economics, EN26 for management science). Your final degree check will indicate which level of honors you receive.

1. Complete either a management science major or the honors track of the economics major, both of which require fifteen upper-division courses. The honors track of the economics major consists of the course work of a regular economics major (twelve upper-division courses) plus one advanced microeconomics course (Economics 105, 107, 109, 113, 117, 150, 151, 155, or 179), one advanced macroeconomics course (Economics 103 or 146), and one advanced econometrics course (Economics 121, 125, 174, 175, 176, or 178). Typically, a course will qualify as "advanced" if it has the corresponding core courses as prerequisites. As an example, a course with an Economics 100A-B prerequisite will typically qualify as an advanced microeconomics course.
2. Have an upper division GPA in your major greater than or equal to 3.5. Typically, the upper-division major GPA will exclude grades for courses taken at universities other than those in the UC system.
3. Take the honors versions of at least two upper-division courses (Economics 100AH-BH, 110AH-AH, 120AH-BH-CH, and 170AH-BH), and take the senior essay seminar (Economics 191A-B). The GPA across these four or more courses must be 3.5 or above. Admission to these courses is by special permission; check with the undergraduate adviser in the Economics Student Services Office.

Grade Rules for Majors

All courses used in meeting requirements for a departmental major must be taken on a letter-grade basis, and must be passed with a grade of C– (C minus) or better. These rules apply to lower-division as well as upper-division courses, and to courses taken from other departments (such as required mathematics courses). Exceptions are courses such as Economics 195 and Economics 199, for which P/NP grading is mandatory. However, no more than twelve units taken P/NP may be counted toward a major.

Advanced Placement Credits

Because no high school economics course provides the kind of background needed for upper-division economics and management science, we are strict on allowance of credits. The policy is as follows: If the AP score is 5, accept AP Micro (AP Macro) as equivalent to Economics 1 (Economics 3) in meeting major or minor requirements. If the score is 3 or 4, the student is required to take Economics 1 (3) for the major or minor. There is not an advanced placement exam equivalent to Economics 2.

Minors and Programs of Concentration

The economics minor or program of concentration consists of eight courses: introductory microeconomics (Economics 1); microeconomic applications (Economics 2); introductory macroeconomics (Economics 3); and five upper-division

economics courses, which are otherwise not restricted.

The management science minor, paralleling the economics minor, consists of nine courses: introductory microeconomics (Economics 1); microeconomics applications (Economics 2); introductory macroeconomics (Economics 3); financial accounting (Economics 4), and any five from the following list (Caution: some courses have prerequisites):

Economics 170A	Managerial Microeconomics
Economics 170B	Managerial Microeconomics
Economics 120A	Econometrics
Economics 120B	Econometrics
Economics 120C	Econometrics
Economics 171	Decisions Under Uncertainty
Economics 172A	Operations Research
Economics 172B	Operations Research
Economics 172C	Operations Research
Economics 173	Corporate Finance
Economics 174	Insurance, Economics and Finance
Economics 175	Financial Investments
Economics 176	Marketing
Economics 178	Economic and Business Forecasting
Economics 179	Decisions in the Public Sector

Grades of P/NP are acceptable for minor courses. If courses are taken for a letter grade, passing is considered with a "D" or better. To declare a minor or program of concentration, obtain a minor declaration form, fill it out, and turn it in to Sequoyah Hall 245. Students should check with their colleges regarding area of focus, programs of concentration, and project minors.

The Graduate Program

The department offers the M.A., C.Phil., and Ph.D. degrees in economics. However, a student must be admitted to the Ph.D. program in order to be eligible for an M.A. or C.Phil. The department also offers the Ph.D. degree in economics and international affairs jointly with the Graduate School of International Relations and Pacific Studies.

The main Ph.D. requirements are that a student pass qualifying exams in microeconomics, macroeconomics, econometrics, select courses of specialization, and prepare an acceptable dissertation. The Ph.D. degree in economics and international affairs also requires successful completion of a language requirement and additional electives offered by IR/PS.

Detailed descriptions of the Ph.D. programs are available by writing to the Graduate Admissions Officer in care of the Department of Economics. Information is also available on the Internet at the department Web site at http://www.econ.ucsd.edu. Residence and other campus wide regulations are described in the graduate studies section of this catalog.

Departmental Ph.D. Time Limit Policies

Students must be advanced to candidacy by the end of five years. Total university support cannot exceed six years. Total registered time at UCSD cannot exceed seven years. Students will not be permitted to continue beyond the pre-candidacy and total registered time limits. Students will not be permitted to receive UCSD administered financial support beyond the support limit.

COURSES

LOWER-DIVISION

1. Elements of Economics I (4)
Introduction to the study of the economic system from the micro, or individual decision maker's, perspective. Analysis of the allocation of resources and distribution of income in perfectly competitive markets. Courses must be taken in 1-2-3 order.

2. Elements of Economics II (4)
Continuation of study of microeconomics: analysis of monopoly and imperfectly competitive markets, the role of government, and cost/benefit analysis. Courses must be taken in 1-2-3 order. *Prerequisite: Economics 1.*

3. Elements of Economics III (4)
Introductory macroeconomics: unemployment, inflation, business cycles, monetary and fiscal policy. Courses must be taken in 1-2-3 order. *Prerequisites: Economics 1 and 2.*

4. Financial Accounting (4)
Recording, organizing, and communicating economic information relating to business entities. *No prerequisites.*

87. Freshman Seminar (1)
The Freshman Seminar Program is designed to provide new students with the opportunity to explore an intellectual topic with a faculty member in a small seminar setting. May be repeated when course topics vary. (P/NP grades only.)

90. Undergraduate Seminar (1)
Selected topics in economics. May be repeated twice (total of three units) when course topic varies. (P/NP grades only.)

UPPER-DIVISION

100A. Microeconomics A (4)
Economic analysis of household determination of the demand for goods and services, consumption/saving decisions, and the supply of labor. Analysis of firms' determination of output and the demand for factors of production. Analysis of perfectly competitive markets. Economics 100A must be taken before Economics 100B. Credit not allowed for both Economics 100A and Economics 170A. *Prerequisites: Economics 1A-B or Economics 1-2-3; and Mathematics 10A or 20A, Mathematics 10B or 20B, and Mathematics 10C or 20C or 21C.*

100B. Microeconomics B (4)
Analysis of the effects of market structure (perfect competition, imperfect competition, and monopoly) and strategic interaction among firms, the distribution of income, and welfare economics. Economics 100A must be taken before Economics 100B. Credit not allowed for both Economics 100B and Economics 170B. *Prerequisite: Economics 100A.*

100AH-BH. Honors Microeconomics (1-1)
Honors sequence covering the material of Economics 100A-B. *Prerequisites: GPA of 3.5 or better. Department stamp required. Economics 100A must be taken with 100AH, and 100B must be taken with 100BH.*

101. International Trade (4)
Determinants of trade in goods and services, international flows of labor and capital, and the effects of trade policy on welfare and income distribution. Issues such as competitiveness, immigration policy, trading blocs, and industrial policy. *Prerequisites: Economics 1A-B or 1-2-3. Recommended: Economics 100A-B or 170A-B.*

103. International Monetary Relations (4)
Balance of payments, international capital movements, and foreign exchange examined in light of current theories, policies, and problems. *Prerequisites: Economics 110A-B.*

105. Industrial Organization and Antitrust Policy (4)
Structure and performance of U.S. industry. Pricing, advertising, product strategies, cartel behavior, and strategic entry barriers. Detailed treatment of antitrust policy. *Prerequisites: Economics 100A-B or 170A-B.*

107. Economic Regulation (4)
Theory and application of economic regulation. Natural monopoly, nonlinear pricing, Ramsey pricing, franchise bidding. Discussion of U.S. electric utilities, gas utilities, broadcasting, surface transportation, and air transportation. *Prerequisites: Economics 100A or 170A.*

109. Game Theory (4)
Introduction to game theory. Analysis of people's decisions when the consequences of the decisions depend on what other people do. Applications to economic, political, and social interactions. *Prerequisites: Economics 100A-B or 170A-B.*

110A. Macroeconomics A (4)
Analysis of the determination of long run growth and models of the determination of output, interest rates, and the price level. Analysis of inflation, unemployment, and monetary and fiscal policy. Economics 110A must be taken before Economics 110B. *Prerequisites: Economics 1A-B or 1-2-3; and Mathematics 10C or 20C or 21C.*

110B. Macroeconomics B (4)
Analysis of the determination of consumption spending at the aggregate level; extension of the basic macro model to include exchange rates and international trade; the aggregate money supply, and the business cycle. Economics 110A must be taken before Economics 110B. *Prerequisites: Economics 110A.*

110AH-BH. Honors Macroeconomics (1-1)
Honors sequence covering the material of Economics 110A-B. *Prerequisites: GPA of 3.5 or better. Department stamp required. Economics 110A must be taken with 110AH, and 110B must be taken with 110BH.*

111. Monetary Economics (4)
Financial structure of the U.S. economy. Bank behavior. Monetary control. *Prerequisites: Economics 1A-B or 1-2-3 and Mathematics 10A or 20A.*

113. Mathematical Economics (4)
Mathematical concepts and techniques used in advanced economic analysis; applications to selected aspects of economic theory. *Prerequisites: Economics 100A-B, or Economics 170A-B; or Mathematics 140A; or Mathematics 142A.*

114. Economics of Immigration (4)
Examination of the economic causes and consequences of international migration. Economic reasons that motivate people to migrate, the labor market and fiscal impacts of immigration on sending and receiving countries, the economic consequences of current immigration policies. Emphasis on mid-twentieth century immigration to the U.S. from Asia and Latin America with some consideration given to aspects of other international migrations. *Prerequisites: Economics 1A-B or 1-2-3.*

116. Economic Development (4)
Analysis of current economic problems of less-developed areas and conditions for increasing their income, employment, and welfare; case studies of specific less-developed countries. *Prerequisite: Economics 1A-B or 1-2-3.*

117. Economic Growth (4)
Models of the economic growth of developed economies. *Prerequisites: Economics 100A or 170A.*

118A. Law and Economics A (4)
Course uses economic theory as the basis for evaluating the economic efficiency of both actual and theoretical legal doctrines in several legal fields. Basic principles of law and economic theory applied to questions posed by the law: torts (accidents), product liability law, property law, criminal law (law enforcement), and litigation. Issues of risk bearing and why people buy insurance. Economics 118B may be taken before 118A. *Prerequisites: Economics 1A-B or 1-2; and Mathematics 10A or 20A.*

118B. Law and Economics B (4)
Course uses economic theory as the basis for evaluating the economic efficiency of both actual and theoretical legal doctrines. Basic principles of law and economic theory applied to questions posed by the law: contract law, the law of corporate organization (how firms are legally structured), bankruptcy law, and debtor-creditor law. Economics 118B may be taken before Economics 118A. *Prerequisites: Economics 1A-B or 1-2; and Mathematics 10A or 20A.*

120A. Econometrics A (4)
Probability and statistics used in economics. Probability and sampling theory, statistical inference, and use of spreadsheets. Courses must be taken in A-B-C order. Credit not allowed for Economics 120A and any of the following: ECE 109; Mathematics 180A; or Mathematics 183. *Prerequisites: Economics 1A-B or 1-2-3; and Mathematics 10A or 20A, Mathematics 10B or 20B, and Mathematics 10C or 20C or 21C.*

120B. Econometrics B (4)
Basic econometric methods, including the linear regression model, heteroskedasticity, serial correlation, hypothesis testing, forecasting, and identification. Courses must be taken in A-B-C order. Credit not allowed for Economics 120A and Mathematics 181A. *Prerequisite: Economics 120A or ECE 109 or Mathematics 180A or Mathematics 183.*

120C. Econometrics C (4)
Advanced econometric methods: time series analysis, estimation in the presence of autocorrelated and heteroskedastic errors, estimation of simultaneous equations models, estimation of discrete choice models, and econometric methods designed for panel data sets. *Prerequisite: Economics 120B.*

120AH-BH-CH. Honors Econometrics (1-1-1)
Honors sequence covering the material of Economics 120A-B-C. *Prerequisites: GPA of 3.5 or better. Department stamp required. Economics 120A must be taken with 120AH, 120B must be taken with 120BH, and 120C must be taken with 120CH.*

121. Applied Econometrics (4)
Application of econometric methods to such areas as labor supply, human capital, and financial time series. *Prerequisites: Economics 120A-B-C. Concurrent enrollment in Economics 120C is permitted.*

125. Economics of Population Growth (4)
Economics of population growth, family size, age profiles, birth and death rates, growth of cities. *Prerequisites: Economics 120A-B-C. Concurrent enrollment in Economics 120C is permitted. Economics 178 is recommended.*

130. Public Policy (4)
Role of economics in public policy. Topics such as funding health care, drug policy, incentives for high technology industries, mass transit versus highway construction, and agriculture subsidies. Term paper usually required. *Prerequisites: Economics 1A-B or 1-2.*

131. Economics of the Environment (4)
Environmental issues from an economic perspective. Relation of the environment to economic growth. Management of natural resources, such as forest and fresh water. Policies on air, water, and toxic waste pollution. International issues such as ozone depletion and sustainable development. *Prerequisites: Economics 1A-B or 1-2.*

132. Energy Economics (4)
Energy from an economic perspective. Fuel cycles for coal, hydro, nuclear, oil, and solar energy. Emphasis on efficiency and control of pollution. Comparison of energy use across sectors and across countries. Global warming. Role of energy in the international economy. *Prerequisites: Economics 1A-B or 1-2.*

135. Urban Economics (4)
(Same as USP 102.) Economic analysis of why and where cities develop, problems they cause, and public policies to deal with these problems. Determination of urban land rent/use, reasons for suburbanization. Transportation and congestion in cities, zoning, poverty and housing, urban local government. *Prerequisites: Economics 1A-B or 1-2 and Mathematics 10A or 20A.*

136. Human Resources (4)
Theoretical and empirical analysis of public and private investment in people, emphasizing the contribution to productivity of education. *Prerequisites: Economics 1A-B or 1-2-3 and Mathematics 10A-B-C, or 20A-B and 20C/21C.*

137. Inequality and Poverty (4)
Analysis of inequality in the distribution of income, education, and wealth; causes of poverty and public policies to combat it. *Prerequisites: Economics 1A-B-C, 120A, or Mathematics 180A or Mathematics 183 or ECE 109.*

138A. Economics of Health A (4)
The application of economic analysis to the health field. Issues related to the production of health services and the demand for health care, including the role of insurance. *Prerequisites: Economics 1A-B or 1-2-3.*

138B. Economics of Health B (4)
Current health policy issues. Includes benefit-cost analysis of potential policy changes and health care options, the role of changing technology, private, nonprofit and government provision of health care, regulation of health care entities such as drug companies, HMOs, and nursing homes. Economics 138A must be taken before Economics 138B. *Prerequisites: Economics 138A.*

139. Labor Economics (4)
Operation of labor markets. Such topics as labor force participation, unemployment, labor mobility, wage inflation, the impact of unions, human capital investments, internal labor markets, and labor market discrimination. *Prerequisites: Economics 1A-B or 1-2-3.*

145. Economics of Ocean Resources (4)
Economic issues associated with oceans. Economics of managing renewable resources in the oceans, with an emphasis on fisheries, economics of conservation and biodiversity preservation for living marine resources, with an emphasis on whales, dolphins, sea-turtles, and coral reefs.

146. Economic Stabilization (4)
Theory of business cycles and techniques used by governments to stabilize an economy. Discussion of recent economic experience. *Prerequisites: Economics 110A-B.*

147. Economics of Education (4)
Examination of issues in education using theoretical and empirical approaches from economics. Analysis of decisions to invest in education. Consideration of various market structures in education, including school choice and school finance programs. *Prerequisites: Economics 1A-B or 1-2-3 and Economics 120A or ECE 109 or Mathematics 180A or Mathematics 183.*

150. Economics of the Public Sector: Taxation (4)
Overview of the public sector in the U.S. and the scope of government intervention in economic life. Basic principles of taxation, tax incidence, and tax efficiency. Analysis of the U.S. tax system before and after the Tax Reform Act of 1986. *Prerequisites: Economics 100A or 170A.*

151. Economics of the Public Sector: Expenditures (4)
Overview of the public sector in the U.S. and the scope of government intervention in economic life. Theory of public goods and externalities. Introduction to the basic forms of government intervention. Evaluation of specific expenditure programs such as education and national defense. *Prerequisites: Economics 100A or 170A.*

153. Economics of the Public Sector: Income Maintenance and Insurance (4)
Overview of the public sector in the U.S. and the scope of government intervention in economic life. Theory of income redistribution and social insurance. Applications to current policy in such areas as welfare, unemployment insurance, and Social Security. *Prerequisites: Economics 100A or Economics 170A.*

155. Economics of Voting and Public Choice (4)
An economic analysis of social decision making, including such topics as the desirable scope and size of the public sector, the efficiency of collective decision-making procedures, voting theory and collective vs. market resource allocation. *Prerequisite: Economics 100A-B or 170A-B.*

158A-B. Economic History of the United States (4-4)
(Same as History HIUS 140–141.) 158A: The United States as a raw materials producer, as an agrarian society, and as an industrial nation. Emphasis on the logic of the growth process, the social and political tensions accompanying expansion, and nineteenth- and early twentieth-century transformations of American capitalism. 158B: The United States as a modern industrial nation. Emphasis on the logic of the growth process, the social and political tensions accompanying expansion, and twentieth-century transformations of American capitalism.

161. Latin American Economic Development (4)
Development issues facing Latin American countries. Economic policy. Emphasis on Argentina, Brazil, Chile, and Mexico. *Prerequisite: Economics 1*A-B or 1-2-3.

163. Japanese Economy (4)
Survey of Japanese economy. Topics such as economic growth, business cycles, saving-investment balance, financial markets, fiscal and monetary policy, labor markets, industrial structure, international trade, and agricultural policy. *Prerequisite: Economics 1A-B or 1-2-3.*

165. Middle East Economics (4)
Internal economies of radical religious groups and terrorist organizations, oil economics, Ottoman economic history, Islamic banking, economic development and peace in Palestine, economic demography and migration. Prerequisites: *Economics 1A-B or 1-2-3.*

170A. Management Science Microeconomics A (4)
Intermediate microeconomics, including techniques of marginal analysis, demand theory and optimal pricing, estimation of demand function, forecasting, production theory, cost analysis and transfer pricing, and competitive and monopolistic market structure. Credit not allowed for both Economics 100A and Economics 170A. *Prerequisites: Economics 1A-B or 1-2-3; and Mathematics 20A, 20B, and 20C or 21C.*

170B. Management Science Microeconomics B (4)
Intermediate microeconomics, including oligopoly theory, game theory and competitive strategy, externalities and public goods, and information economics (adverse selection, signing, and principal-agent problems), with emphasis on the theory of the firm. Economics 170A must be taken before 170B. Credit not allowed for both Economics 100B and Economics 170B. *Prerequisite: Economics 170A.*

170AH-BH. Honors Management Science Microeconomics (1-1)
Honors sequence covering the material of Economics 170A-B. *Prerequisite: GPA of 3.5 or better. Department stamp required. Economics 170A must be taken with 170AH, and 170B must be taken with 170BH.*

171. Decisions Under Uncertainty (4)
Decision-making when the consequences are uncertain. Decision trees, payoff tables, decision criteria, expected utility theory, risk aversion, sample information. *Prerequisites: Economics 120A and Mathematics 20F.*

172A-B-C. Introduction to Operations Research (4-4-4)
Linear, nonlinear, and integer programming. Elements of game theory. Deterministic and stochastic dynamic programming. *Prerequisites: Economics 120A and Mathematics 20F. Economics 172A may be taken concurrently with 120A. Economics 172A must be taken first, but Economics 172B may be taken before or concurrently with 172C.* A student may not receive credit for both Economics 172A-172B and Mathematics 171A-171B.

173. Corporate Finance (4)
Corporate financial management, cash flow analysis, capital budgeting and capital structure. Institutional issues in project analysis, performance evaluation, and financial planning. *Prerequisite: Economics 4.*

174. Financial Insurance (4)
Insurance markets, law, and terminology. Demand for insurance and for lotteries. Contingent claims theory. Reserves management and efficient risk sharing. Financial theories for regulating insurance rates. Options and insurance. Moral hazard. Adverse selection. Current controversies in insurance. *Prerequisites: Economics 120A-B-C and either 100A or Economics 170A. Concurrent enrollment in Economics 120C is permitted. Economics 171 and Economics 175 are recommended.*

175. Financial Investments (4)
Valuation of assets including stocks, bonds, options, and futures contracts. Optimal portfolio selection and risk management. *Prerequisites: Economics 120A.*

176. Marketing (4)
Role of marketing in the economy. Topics such as buyer behavior, marketing mix, promotion, product selection, pricing, and distribution. *Prerequisites: Economics 120A-B-C. Concurrent enrollment in Economics 120C is permitted.*

178. Economic and Business Forecasting (4)
Survey of theoretical and practical aspects of statistical and economic forecasting. Such topics as long-run and short-run horizons, leading indicator analysis, econometric models, technological and population forecasts, forecast evaluation, and the use of forecasts for public policy. *Prerequisites: Economics 120A-B-C. Concurrent enrollment in Economics 120C is permitted.*

179. Decisions in the Public Sector (4)
Decision making in the public sector. Topics such as program evaluation, budgeting, financial management, and expenditure decisions. *Prerequisites: Economics 100A-B or 170A-B.*

181. Topics in Finance (4)
Selected topics in finance. *Prerequisite: consent of department.*

182. Topics in Microeconomics (4)
Selected topics in microeconomics. *Prerequisite: consent of department.*

183. Topics in Macroeconomics (4)
Selected topics in macroeconomics. *Prerequisite: consent of department.*

191A-B. Senior Essay Seminar (4-4)
Senior essay seminar for students with superior records in department majors. *Prerequisite: department stamp required.*

195A-B-C. Introduction to Teaching Economics (4-4-4)
Introduction to teaching economics. Each student will be responsible for a class section in one of the lower-division economics courses. Limited to advanced economics majors with at least a 3.5 GPA in upper-division economics work. (P/NP grades only.) *Prerequisite: consent of the department. May not use more than eight units for credit.*

198. Directed Group Study (2 or 4)
Directed study on a topic or in a group field not included in regular department curriculum by special arrangement with a faculty member. *Prerequisites: upper-division standing and consent of instructor. May be repeated up to three times when course topics vary.* (P/NP grades only.)

199. Independent Study (2 or 4)
Independent reading or research under the direction of and by special arrangement with a Department of Economics faculty member. (P/NP grades only.) *Prerequisites: consent of instructor and departmental approval.*

GRADUATE

200A-B-C. Microeconomics (4-4-4)
Background mathematical techniques, static and intertemporal consumer and producer theory, partial and general equilibrium, modern producer and consumer theory, risk, time, and interdependence, modern welfare economics.

201. Advanced Economic Theory (4)
An intensive examination of selected topics in economic theory. Course topic nonrepetitive in a three-year cycle. *Prerequisites: Economics 207 and 213.*

202A-B-C. Workshop in Economic Theory (0-4/0-4/0-4)
An examination of recent research in economic theory, including topics in general equilibrium, welfare economics, duality, and social choice; development of related research topics by both graduate students and faculty. Course may be repeated an unlimited number of times. (S/U grades only.) *Prerequisite: Economics 207 or consent of instructor.*

205. Mathematics for Economists (4)
Advanced calculus review for new graduate students.

206. Decisions (4)
Further topics in consumer and producer theory, intertemporal optimization, and decision-making under uncertainty. (Previously numbered Economics 200D.) *Prerequisites: Economics 200A-B-C or consent of instructor.*

207. Markets and Welfare (4)
Further topics in general equilibrium, welfare analysis, and social choice theory. (Previously numbered Economics 200E.) *Prerequisite: Economics 200A-B-C or consent of instructor.*

208. Games and Information (4)
Further topics in game theory and the economics of information. (Previously numbered Economics 200F.) *Prerequisite: Economics 200A-B-C or consent of instructor.*

210A-B-C. Macroeconomics (4-4-4)
Neoclassical and Keynesian theories of employment, income, interest rate, price level, and other aggregate variables; macroeconomic policy; balance of payments and exchange rates; conflicts between external and internal balance; disequilibrium theory; growth theory.

211. Advanced Macroeconomics (4-4-4)
Selected theoretical and empirical issues in macroeconomics. *Prerequisite: Economics 213 or consent of instructor.*

212A-B-C. Workshop in Macroeconomics (4-4-4)
Examination of recent research in macroeconomics; development of own research by graduate students and faculty. *Prerequisite: Economics 210C.*

213. Advanced Macroeconomic Theory (4)
Dynamic analysis, multiple equilibria, modern growth theory, computational methods. (Previously numbered Economics 210D.) *Prerequisites: Economics 210A-B-C or consent of instructor.*

214. Applied Macroeconomics (4)
Monetary policy, business cycles, factor utilization, investment, heterogeneity. (Previously numbered Economics 210E.) *Prerequisites: Economics 210A-B-C or consent of instructor.*

220. A-B-C-D-E-F. Econometrics (4-4-4-4-4-4)
The construction and application of stochastic models in economics. This includes both single and simultaneous equations models. Matrix algebra and basic statistics are covered. Also covered (in 220F) are empirical applications to micro and macroeconomics. These require the completion of an empirical project.

221. Advanced Econometrics (4)
Extensions of the theory of the linear model; Bayesian analysis; principal components, discriminant analysis, spectral analysis of time series; insufficient data problems and the use of generalized inverse matrices; experimental design; formulation and evaluation of economic models, including the interpretation and testing of causality. *Prerequisite: Economics 220F or consent of instructor.*

222A-B-C. Workshop in Econometrics (4-4-4)
Examination of recent econometric research; development of own research by students and faculty. Course may be repeated an unlimited number of times. (S/U grades only.)

224. Readings in Econometrics (1)
Examination of recent research in econometrics to facilitate the development of thesis research by graduate students.

230. Public Economics: Taxation (4)
Theoretical and empirical issues in public economics. (Previously numbered Economics 230A.) *Prerequisite: consent of instructor.*

231. Public Economics: National Government Expenditures (4)
Theoretical and empirical issues in public economics. (Previously numbered Economics 230B.) *Prerequisite: consent of instructor.*

232. Public Economics: Fiscal Federalism (4)
Theoretical and empirical issues in public economics. (Previously numbered Economics 230C.) *Prerequisite: consent of instructor.*

235A-B-C. Workshop in Applied Microeconomics and Industrial Organization (0-4/0-4/0-4)
Examination of recent research in applied economics; development of own research by graduate students and faculty. Course may be repeated an unlimited number of times. (S/U grades only.)

240. Economic Development (4)
Theoretical and empirical issues in economic development. *Prerequisite: consent of instructor.*

245. International Economics (4)
Theory of international trade, finance, and monetary relations. Growth, disturbances, capital movements, and balance of payments adjustment. International economic policy and welfare. (Previously numbered Economics 232A-B-C.) *Prerequisite: consent of instructor.*

250. Labor Economics (4)
Theoretical and empirical issues in human resource economics. (Previously numbered Economics 236A-B.) *Prerequisite: consent of instructor.*

260. Industrial Organization (4)
Theoretical and empirical issues in industrial organization. (Previously numbered Economics 234.) *Prerequisite: Economics 220F or consent of instructor.*

264. Experimental Economics (4)
Design and interpretation of controlled experiments using human subjects. (Previously numbered Economics 207.) *Prerequisite: consent of instructor.*

266. Economics of Natural Resources (4)
Theoretical and empirical issues in natural resource economics. (Previously numbered Economics 242.) *Prerequisite: consent of instructor.*

270. Finance—Core Asset Pricing (4)
Theoretical and empirical issues in finance. (Previously numbered Economics 214A.)

271. Finance—Market Micro Structure and Volatility Modeling (4)
Theoretical and empirical issues in finance. (Previously numbered Economics 214B.)

272. Finance—Theory and Testing of Intertemporal Asset Pricing Models (4)
Theoretical and empirical issues in finance. (Previously numbered Economics 214C.)

279. Readings in Finance (1)
Examination of recent research in finance to facilitate the development of thesis research by graduate students. *Prerequisite: consent of instructor.*

280. Computation (2)
Introduction to econometric computing. (S/U grades only.)

281. Special Topics in Economics (4)
A lecture course at an advanced level on a special topic (or set of related topics) in economics. May be repeated for credit if topic differs. (Previously numbered Economics 267.) *Prerequisite: consent of instructor.*

282. Third-Year Paper (4)
Written project, such as a critical review of a body of literature, including a proposal for an original research paper. For third-year students in winter quarter. (Previously numbered Economics 272.)

283. Third-Year Paper Presentations (4)
Workshop for students writing third-year papers. All papers will be formally presented in the workshop. (Previously numbered Economics 273.)

284. Third-Year Original Paper (4)
Original research paper. For third-year students. (Previously numbered Economics 274.)

285. Third-Year Original Paper Presentations (4)
Workshop for students writing third-year original papers. All papers will be formally presented in the workshop. (Previously numbered Economics 275.)

290A-B-C. Colloquium in Economics (0-0-0)
Lectures presented by visiting speakers on research in a variety of topics in both Theoretical and Applied Economics.

291. Advanced Field Advising (4)
Controlled reading and discussion with adviser; literature survey. May be repeated for credit. (S/U grades only.)

297. Independent Study (1-5)
(S/U grades only.)

299. Research in Economics for Dissertation (1-9)
(S/U grades only.)

500A-B-C. Teaching Methods in Economics (4-4-4)
The study and development of effective pedagogical materials and techniques in economics. Students who hold appointments as teaching assistants must enroll in this course, but it is open to other students as well. (S/U grades only.)

Education Abroad Program (EAP)

OFFICE: Programs Abroad Office in the International Center (corner of Gilman Drive and Library Walk)
(858) 534-1123
http://www.ucsd.edu/icenter/pao

David Mares, Political Science, *Faculty Director*
Ramon Piñon, Biology, *Faculty Director*
Mary Dhooge, *Dean of International Education*
Kimberly Burton, *Director for Programs Abroad*
Molly Ann McCarren, *EAP Coordinator*
Bill Clabby, *EAP Adviser*
Joan Adamo, *EAP Adviser*
Tonia Luo, *EAP Adviser*

Administered by the University of California, the Education Abroad Program (EAP) has established study centers in Australia, Barbados, Brazil, Canada, Chile, China, Costa Rica, Czech Republic, Denmark, Egypt, France, Germany, Ghana, Hong

Kong (S.A.R.), Hungary, India, Ireland, Israel, Italy, Japan, Korea, Mexico, Netherlands, New Zealand, the Philippines, Russia, Singapore, South Africa, Spain, Sweden, Taiwan, Thailand, Turkey, the United Kingdom, and Vietnam. EAP offers full-year and short-term programs in a wide range of academic disciplines. Please see the EAP Web site (http://eap.ucop.edu) for the most up-to-date information about all aspects of the program. Students may use the EAP Program Wizard (http://eap.ucop.edu/programwizard) to search for programs by country, specific areas of study, language of instruction, etc. EAP participants are eligible for financial aid and many scholarships. Other non-EAP study-abroad opportunities at UCSD are described at the end of this section.

Purpose

The Education Abroad Program offers undergraduate (sophomores, juniors, and seniors) and graduate students opportunities to integrate into the academic and social life of select foreign universities while continuing to work in major fields of study or otherwise fulfilling UC requirements. EAP provides students access to distinguished academic programs that complement those of the UC campuses and where students can make normal progress toward their degrees at a cost as close as possible to that of education on a UC campus. EAP helps students acquire the knowledge and skills necessary to function confidently and compete successfully in our global environment.

The program stimulates the intellectual development of the participants, broadening their general education, and giving a new depth to their particular academic interests. Most gain fluency in a language other than their own, and all grow in their ability to engage in independent study. Perhaps most valuable of all are increased self-understanding, clarified life purposes, and a broadening and deepening of personal values.

The Academic Program

The Education Abroad Program places students at the finest universities abroad. In most cases students take courses side by side with local students in a wide range of academic fields. In some programs EAP students pursue language study and take special courses designed for foreign students. In others, they pursue specialized studies in their major, take courses to add breadth to their general education, concentrate on language or area studies, and conduct research.

Each student is concurrently enrolled on the home campus of the University of California and at the host university. Full academic credit is received for courses satisfactorily completed. The selection of courses is such that, by advance planning and wise choice, most students can make normal progress toward completion of major, minor, and/or general-education requirements for their UCSD degree.

Academic Planning and Advising

Students who wish to make normal progress toward graduation should counsel in advance with departmental advisers and an academic adviser in their college provost's office in order to ascertain how participation will affect their academic program. Descriptions of individual courses currently approved for UC credit may be found in the Programs Abroad Resource Library and on the EAP Web site (http://eap/ucop/edu/coursefinder). Many of the same or similar courses will be available in future years, but students should plan programs that are sufficiently flexible to allow them to take alternate courses. Each year new courses taken by UC students are added to a center's approved offerings. Although courses approved by the University of California carry full credit, each department retains the right to determine the extent to which it will accept specific courses to fulfill requirements for its own majors.

In order to facilitate the academic work of the students, University of California professors serve as directors and associate directors of the study centers. They work with their counterparts in the host university in developing the academic program and advise students on their coursework. In addition, the directors are responsible for all aspects of student welfare and conduct.

Cost, Financial Aid, and Scholarships

The regents endeavor to bring the program within the reach of all students, regardless of their financial resources. The cost of studying abroad is usually comparable to the cost of studying on a UC campus. The only additional costs directly related to the program are for round-trip transportation, on-site orientation, and personal expenses beyond what normally would be spent at home. Programs in some countries actually cost less than a comparable period of study at a UC campus.

Many forms of financial assistance are available to EAP students. Those already receiving UC financial aid maintain their eligibility for grants, loans, and scholarships while studying on EAP. Financial aid is based on the cost of studying at each EAP location and on individual need. Students who might not normally be eligible for financial aid may qualify for the period they are on EAP. In addition to UC financial aid, scholarships are also available from EAP, the Friends of the International Center, various campus offices and departments, and outside organizations. Annually, UCSD students access more than $500,000 in special scholarships available only for study abroad. Information about some of these scholarships is available on the student financial services web site (http://www.ucsd.edu/finaid).

Prospective participants who require financial assistance should counsel early with the Student Financial Services Office. Study abroad scholarship information is available in the Programs Abroad Office.

Applications

Applications for admission to the Education Abroad Program are given to students following a discussion of various aspects of the program with an EAP adviser in the Programs Abroad Office. Information on deadlines and related matters such as course offerings, selection, schedules of departures, and payment of fees may be obtained from the Programs Abroad Office.

It is not too early to begin planning for an experience abroad prior to or during one's freshman year. Students are then able to take the language classes needed for certain programs, as well as plan which degree requirements to fulfill at UCSD and which to take abroad. Early planning also allows students to apply for the many programs now open to sophomores. General group information sessions about the programs are held during Welcome Week and in October and January.

Selection

Undergraduate selection is generally open to students with the following qualifications: 3.0 cumulative grade-point average at the time of

Summary of EAP Opportunities by Country

	PROGRAM OPTIONS				ELIGIBILITY				
EAP HOST COUNTRY	**YEAR**	**SEMESTER**	**QUARTER**	**SUMMER**	**SOPHOMORE**	**JUNIOR**	**SENIOR**	**GRADUATE**	**APPLICATIONS ARE DUE TO CAMPUS EAP OFFICE IN...**
AUSTRALIA*	X	FS				X	X	X	**Fall:** January **Year/Spring:** May
BARBADOS	X	F				X	X	X	January
BRAZIL*	X	FS			X	X	X	X	**Year/Spring:** May **Fall:** January
CANADA	X	FS				X	X	X	**Year/Fall:** January **Spring:** May
CHILE*	X	FS			X	X	X	X	**Spring/Year:** May **Fall:** January
CHINA	X	F		X	X	X	X	X	January
COSTA RICA*	X	S	FS			X	X	X	**Year/Spring:** May (San José) **Fall/Spring:** November (Monteverde)
CZECH REPUBLIC		S				X	X	X	February
DENMARK	X	FS		X	X	X	X	X	**Summer/Fall/Year:** January **Spring:** May
EGYPT	X					X	X	X	January
FRANCE	X	FS			X	X	X	X	**Fall/Year:** January **Spring:** May
GERMANY	X	FS			X	X	X	X	**Fall/Year:** February **Spring:** October
GHANA	X	F			X	X	X	X	January
HONG KONG (S.A.R.)	X	FS				X	X	X	**Fall/Year:** January **Spring:** May
HUNGARY	X	FS				X	X	X	**Fall/Year:** February **Spring:** May
INDIA		F				X	X	X	January
IRELAND, REPUBLIC OF	X					X	X	X	November
ISRAEL	X	FS		X	X	X	X	X	Program Suspended
ITALY	X	FS	WS	X	X	X	X	X	**Summer/Fall/Year:** January **Spring:** November/May **Winter:** May
JAPAN	X	FS			X	X	X	X	**Year:** November **Fall:** January/November **Spring:** May/October
KOREA	X	F		X	X	X	X	X	January
MEXICO	X	FS		X	X	X	X	X	**Summer/Fall/Year:** January **Spring:** May
NETHERLANDS	X	FS			X	X	X	X	**Fall/Year:** January **Spring:** May
NEW ZEALAND*	X					X	X	X	May
PHILIPPINES	X			X	X	X	X	X	February
RUSSIA		F			X	X	X	X	February
SINGAPORE	X	FS			X	X	X	X	**Fall/Year:** January **Spring:** May
SOUTH AFRICA*	X	FS				X	X	X	**Fall:** January **Year/Spring:** May
SPAIN	X	FS			X	X	X	X	**Fall/Year:** January **Spring:** May
SWEDEN	X	F		X	X	X	X	X	January
TAIWAN	X	F				X	X	X	January
THAILAND	X	FS				X	X	X	**Fall/Year:**January **Spring:** May
TURKEY	X	F				X	X	X	January
UNITED KINGDOM	X	F		X	X	X	X	X	**Year:** November **Summer/Fall:** January
VIETNAM		F				X	X	X	February

F=Fall Term W=Winter Term S=Spring Term *The regular academic year begins in January or February rather than during the fall

For program details see your Campus EAP Office and visit the EAP Web site at **http://eap.ucop.edu**

departure (some programs are available to students with at least a 2.5 GPA); at least sophomore or junior standing by time of departure, depending on the specific program; support of the UCSD EAP Selection Committee; and completion of university-level language courses when required (one, two, or three years, depending on the host institution) with a 3.0 grade-point average in language. Exceptions to these requirements can be made on a case by case basis, in consultation with the EAP adviser.

In addition to academic criteria for selection, the faculty committee looks for indications of the student's seriousness of purpose, maturity, and capacity to adapt to the experience of study abroad. As part of the planning process, students are required to consult with their college academic and department advisers.

Graduate Students

Graduate students can be accommodated at most EAP-affiliated host universities. Graduate students may take courses, conduct research, and participate in short-term language programs for a semester or year. Students must meet EAP minimum requirements, including language prerequisites, have completed at least one year of graduate work, and have the support of their academic department and graduate dean.

Transfer Students

Transfer students from other colleges and universities are eligible for EAP. Applications may be submitted prior to their first quarter at UCSD if appropriate for the specific program. Please contact the Programs Abroad Office for further information.

Safety, Student Conduct, and Parental Approval

EAP considers student health and safety while abroad one of its top priorities. All participants in EAP are covered by a mandatory health insurance policy while abroad. While no one can guarantee student security either in the U.S. or abroad, the program makes every reasonable effort to assure a safe environment in its programs abroad, and to counsel students on potential risks and necessary precautions. In return, participants have a responsibility to pay careful attention to safety and health information provided in pre-departure materials and at orientations in the U.S. and abroad.

It is anticipated that the students selected for the Education Abroad Program will be of high caliber, committed to profiting from both the intellectual and social aspects of the experience. Since they will be guests in another country and another university, their conduct will reflect on both the University of California and the United States.

Participation in the program by students who are minors must be approved by their parents or guardians. In approving such participation, parents and guardians should be aware that a greater degree of personal freedom is afforded to students in the foreign university and that the University of California cannot take responsibility for closely supervising the activities of individual students. The directors of the centers will be available to students with problems and will maintain close contact with the student group as a whole. The university provides for comprehensive medical and hospitalization coverage for all participants.

UCSD Opportunities Abroad Program

OFFICE: Programs Abroad Office in the International Center (corner of Gilman Drive and Library Walk)
(858) 534-1123
http://www.ucsd.edu/icenter/pao
David Mares, Political Science, *Faculty Director*
Ramon Piñon, Biology, *Faculty Director*
Mary Dhooge, *Dean of International Education*
Kimberly Burton, *Director for Programs Abroad*
William Clabby, *OAP Coordinator*
Joan Adamo, *OAP Adviser*
Tonia Luo, *OAP Adviser*

Students interested in going abroad should also investigate possibilities through the Opportunities Abroad Program which can assist with placement in a wide range of other academic programs. These programs include study for an academic year, semester, quarter, or summer. They may be sponsored by other U.S. universities, or include direct enrollment in foreign institutions. Academic credit may also be earned on a number of overseas internship programs which combine work experience and courses.

Students going abroad through the Opportunities Abroad Program earn transfer credit from the sponsoring institution. Courses taken abroad may satisfy general-education, major or minor requirements, depending on department or college approval. Federal and state financial aid for approved plans of study abroad is available. Special study abroad scholarships are also available.

In addition to these academic programs, the Programs Abroad Office and its extensive resource library can assist students in selecting a wide range of volunteer, paid work, and educational travel programs.

Eleanor Roosevelt College

OFFICE: Provost, Eleanor Roosevelt College, ERC Administration Building
http://roosevelt.ucsd.edu

The Making of the Modern World/Writing Program

OFFICE: Eleanor Roosevelt College Writing Program, ERC Administration Building

See "The Making of the Modern World" program for Eleanor Roosevelt Writing.

Eleanor Roosevelt College Honors Program

OFFICE: Provost, Eleanor Roosevelt College, ERC Administration Building

Honors programs at Eleanor Roosevelt College have been established to provide exceptionally motivated and capable students with enhanced educational experiences through close interaction with faculty and other honors students. There are two main components to the program: the Freshman Honors Program and the Sophomore Honors Research Project. Participation in either is by invitation.

In the fall quarter of their freshman year, selected students are invited to enroll in the Freshman Honors Seminar, a two- to three-quarter course. During the fall quarter, students meet with a variety of faculty members to learn more about their research, and about academic enrichment opportunities at UCSD. The seminar continues during the winter quarter, focusing on an international theme with faculty speakers.

Honors students may receive opportunities for particular cultural and social events. Second-year students with GPAs of 3.5 or higher have the opportunity to pursue independent study with individual faculty.

Additional honors opportunities are offered in the Making of the Modern World (MMW) sequence. Students with excellent grades in MMW 1, 2, and 3 and high cumulative grade-point averages are eligible to take MMW 4H, 5H, and 6H. Students attend regular course lectures, but meet in separate honors sections. They may also be invited to special guest lectures and enrichment activities connected with MMW.

There are also opportunities for university-wide honors, including provost's honors. Students who maintain a GPA of 3.5 for a full academic year are awarded certificates of merit by the college. UCSD's reputation for excellence is also reflected in the numbers of students who enroll in departmental senior honors programs and who earn college or university honors or election to Phi Beta Kappa.

10. ERC Freshman Honors Seminar (0)
Weekly seminar with faculty members from a variety of disciplines. This seminar provides students with the opportunity to learn more about research and scholarly activities available to them, and acquaints them with UCSD faculty members. *Prerequisite: by invitation only.* Pass/Not Pass grades only.

20. Freshman Honors Seminar: International Themes (1)
This weekly seminar focuses on a chosen international theme with faculty speakers. The structure of the seminar is informal, giving students the opportunity to participate in interactive discussions. *Prerequisite: by invitation only.* Pass/Not Pass only. May be taken for credit two times.

92. Honors Project (2)
Individual project on a topic chosen by the student, done under direction of a faculty member. *Prerequisite: by invitation only.* Pass/Not Pass only. Repeatable for credit twice, up to a total of six units overthree quarters.

196. Honors Project (4)
Senior thesis research project for students who have been accepted into the Eleanor Roosevelt College Individual Studies major. Project will be carried out under supervision of one or more faculty members. Depending on scope of the project, may be taken for four or eight units of credit in a single quarter, or eight units distributed over two quarters. *Prerequisite: admission to Eleanor Roosevelt Individual Studies major.*

199. ERC Independent Studies (4)
The content of this independent study course, which may not duplicate any existing course on campus, will be determined by a supervising faculty member and tailored to fit specific content needs of students pursuing the Eleanor Roosevelt College Individual Studies major. *Prerequisite: admission to ERC Individual Studies major.*

Eleanor Roosevelt Seminar

OFFICE: Provost, Eleanor Roosevelt College, ERC Administration Building

90. Undergraduate Seminar (1)
A seminar intended for exposing undergraduate students, especially freshmen and sophomores, to exciting research programs conducted by the faculty. *Prerequisite: none.* Pass/Not Pass only.

Engineering, Jacobs School of

OFFICE: 7310 Engineering Building Unit 1, Warren Mall
http://www.jacobsschool.ucsd.edu

The Irwin and Joan Jacobs School of Engineering at UCSD comprises the Departments of Bioengineering (BE), Computer Science and Engineering (CSE), Electrical and Computer Engineering (ECE), Mechanical and Aerospace Engineering (MAE), and Structural Engineering (SE). The Jacobs School is directed by the dean of engineering. The departments offer seventeen undergraduate programs that fall into three categories: impacted, pre-major, and open major programs as well as many graduate degree programs. For a complete list of engineering undergraduate and graduate programs, please visit our Web site at http://www.jacobsschool.ucsd.edu. Students interested in engineering should consult the Web site and the individual department listings which follow this section of the catalog.

UCSD's six undergraduate colleges differ in their general-education requirements. Prospective students should review the general-education requirements and take them into account when planning their college curriculum.

Acceptance to the Jacobs School of Engineering

Student demand exceeds program capacity in several of the undergraduate majors. Owing to limited departmental resources, major programs to which more students apply than can be accepted have been declared impacted majors. Acceptance into an impacted engineering major is based on academic excellence demonstrated in high school or at a community college. Acceptance will be granted to the maximum number of students in each of these impacted major programs consistent with maintaining acceptable program quality and in compliance with admissions procedures and criteria approved by the Academic Senate's Committee on Educational Policy.

Remember that admission to the university and to a college does not guarantee acceptance to an impacted major.

FRESHMAN

Freshmen are admitted to engineering majors in one of three ways: open majors, pre-majors and impacted majors.

Open Majors

The following seven majors are open to all admitted UCSD students: aerospace engineering, chemical engineering (offered through the Chemical Engineering Program), engineering science (offered through MAE department), engineering sciences (offered through SE department), environmental engineering, mechanical engineering, and structural engineering. All applicants who have been accepted to UCSD and indicated a pre-major or open engineering major on their application are placed directly into that major.

Pre-major Programs

There are two engineering pre-major programs offered: (1) bioengineering: pre-medical and (2) engineering physics. Incoming freshmen who identified either of these pre-majors as their first choice on their UCSD admissions application are accepted directly into these pre-majors upon admission to UCSD. Subsequent acceptance to the major is dependent on performance in selected mathematics, science, and engineering screening courses as well as competitive grade-point average in the pre-major screening courses.

Pre-major engineering students are expected to apply for acceptance to the major during the spring quarter of their freshman year. Acceptance to the major is based on the grade-point average in the screening courses only. The grade-point average required for acceptance to the major by pre-majors is set

individually by each engineering program. Pre-majors should consult their departments concerning the appropriate screening courses and the current grade-point average standards for acceptance. In addition to the courses required by the departments, it is expected that all pre-major students will take twelve to eighteen units of general-education college requirements during their first year.

Pre-major engineering students who are not able to apply before the end of their third quarter, or who wish to reapply following an unsuccessful application, must contact their department as soon as possible for further advising as **acceptance to any engineering major will not be considered after six quarters of enrollment.**

Impacted Majors

The following six engineering majors are impacted: bioengineering, bioengineering: biotechnology, computer engineering, computer science, and electrical engineering. Applicants must indicate one of these impacted majors as their first choice on their UC application in order to be considered for acceptance to the major by the Jacobs School. The Jacobs School will subsequently notify all engineering students admitted to UCSD of their acceptance status.

Effective fall 2001, this selection is based on the freshman review criteria (Comprehensive Review) administered by the UCSD Office of Admissions and Relations with Schools.

It is strongly suggested that all students accepted into engineering programs consult their department's academic adviser at an early stage to plan their lower-division engineering courses, and that they consult with a college academic counselor to arrange general-education courses around the required screening courses. Students admitted fall quarter should attend the engineering department's orientation meetings during Welcome Week.

Bioinformatics Programs

Students interested in applying to either the bioengineering: bioinformatics major (offered by the bioengineering department), or the computer science major with a specialization in bioinformatics (offered by the computer science and engineering department) should consult individual department listings which follow this section of the catalog.

TRANSFERS

Following California's Master Plan for Higher Education, The Jacobs School of Engineering gives high priority to students transferring from California community colleges.

Transfer students are admitted to engineering majors in one of three ways: open majors, pre-majors, and impacted majors. All applicants who have been accepted to UCSD and indicated a **pre-major** or open engineering major on their application are placed directly into that major.

Effective **fall 2004**, it is **strongly recommended** that transfer students complete the following preparation for engineering majors*:

- Calculus I—for Science and Engineering (Math. 20A)
- Calculus II—for Science and Engineering (Math. 20B)
- Calculus and Analytic Geometry (Math. 20C)
- Differential Equations (Math. 20D)
- Linear Algebra (Math. 20F)
- Complete calculus-based physics series with lab experience (Physics 2A-B-C)
- Chemistry 6A (except Computer Science and Computer Engineering majors)
- Highest level of introductory computer programming language course offerings at the community college**

*Effective **fall 2006**, these courses will be **required** preparation for all engineering transfer students.

**Refer to the *UCSD General Catalog* to select major prerequisite requirement for computer language courses.

Open Majors

The following seven majors are open to all admitted UCSD students: aerospace engineering, chemical engineering (offered through the Chemical Engineering Program), engineering science (offered through MAE), engineering sciences (offered through SE), environmental engineering, mechanical engineering, and structural engineering. All transfer applicants who have been admitted to UCSD and indicated an open engineering major on their application are placed directly into that major.

Pre-major Programs

There are two engineering pre-major programs offered: (1) bioengineering: pre-medical and (2) engineering physics. Subsequent acceptance to the major is dependent on performance in selected mathematics, science, and engineering screening courses as well as competitive grade-point average in the pre-major screening courses.

Pre-major transfer engineering students are expected to apply for acceptance to the major during their third quarter of their first year at UCSD. Acceptance to the major is based on the grade-point average in the screening courses only. The grade-point average required for acceptance to the major by pre-majors is set individually by each engineering program. Pre-majors should consult their departments concerning the appropriate screening courses and the current grade-point average standards for acceptance. In addition to the courses required by the departments, it is expected that all pre-major students will take twelve to eighteen units of general-education college requirements during their first year.

Pre-major transfer engineering students must apply to the major before the end of their third quarter as acceptance to any engineering major by a transfer student will not be considered after the end the of third quarter of enrollment.

Impacted Majors

Since acceptance to impacted engineering majors is quite competitive for freshman and transfer applicants alike, academic standards are high. Transferring students must demonstrate both the completion of most of their lower-division courses at the community college, and a high level of academic competence (GPA) in these courses.

The Jacobs School evaluates transfer students who choose impacted engineering major programs as their first choice major on their UC application. Those seeking acceptance to the following impacted engineering majors: bioengineering and bioengineering: biotechnology, computer science, computer engineering, and electrical engineering will have their community college work evaluated by the Jacobs School of Engineering.

Acceptance to impacted majors may be limited to the best transfer applicants, e.g., those

who have been admitted to UCSD with the most complete lower-division preparation and the highest college grade-point averages. Since acceptance is restricted to these majors, **transfer students are encouraged to apply to more than one major degree program.**

It is strongly suggested that all students accepted into engineering programs consult their department's academic adviser at an early stage to plan their lower-division engineering courses, and that they consult with a college academic counselor to arrange general-education courses around the required screening courses. Students admitted fall quarter should attend the engineering department's orientation meetings during Welcome Week.

For specific program requirements for transfer students, please refer to the appropriate department's listing which follow this section of the catalog.

Bioinformatics Programs

Students interested in applying to either the bioengineering: bioinformatics major (offered by the bioengineering department), or the computer science major with a specialization in bioinformatics (offered by the computer science and engineering department) should consult individual department listings which follow this section of the catalog.

CONTINUING UCSD STUDENTS

UCSD undergraduate students who were not accepted into an engineering major as entering students may, *with engineering departmental approval*, change their major to any **non-impacted engineering major**. Interested students should make an appointment to speak with the departmental undergraduate adviser prior to changing their major.

EXCEPTIONAL ADMISSION PROGRAM (CSE AND ECE IMPACTED MAJORS)

Space permitting and at their sole discretion, the Departments of Computer Science and Engineering and Electrical and Computer Engineering may periodically grant admission to the computer engineering (CE), computer science (CS), or electrical engineering (EE) majors to a small number of academically exceptional UCSD undergraduate students who were not admitted to these majors as entering students. Refer to the department section in this catalog for program requirements and information. At this time, the Department of Bioengineering does not participate in the Exceptional Admission Program for its impacted major programs.

Access of Non-Engineering Majors to the Jacobs School of Engineering Courses

The number of students enrolled in some courses offered by the Jacobs School of Engineering must be restricted to meet the resources available. Students who have successfully completed all prerequisite courses will be enrolled in these restricted courses in the following order:

1. students accepted by the department to a major curriculum
2. students accepted by the department to a minor curriculum
3. students fulfilling a requirement for another major
4. all others, with permission of the department and instructor

Students should check with the departments concerning the limitations on specific courses and the requirements needed prior to attempting to enroll.

Double Majors and Minors

It is the policy of the Jacobs School of Engineering not to approve double majors within engineering. Students who qualify for admission to graduate school and who have the extra time are encouraged to consider co-terminal B.S./M.S. degrees in one or two engineering disciplines. Engineering minors may be taken only by non-engineering majors.

Engineering Student Services (ESS)

The Jacobs School of Engineering supports several programs that promote academic and professional development for undergraduate students across all engineering departments. **ESS** programs are coordinated with the faculty and departments and include the undergraduate Triton Engineering Student Council (TESC) and engineering student professional organizations, Career Connections, the Internship Assistance Program, and Pre-College Outreach.

The Jacobs School also offers activities and services to support economically and educationally disadvantaged students as they begin engineering studies at UCSD and facilitate their retention and graduation in engineering disciplines.

All engineering students are encouraged to become involved with ESS programs. Further information can be obtained at the ESS office in Room 1400, Engineering Building Unit I, or via email at ess@soe.ucsd.edu.

COURSES

101. Team Engineering (4)
Fundamental principles of team engineering practice. Team formation and leadership, project creation and management, statistical tools for quality improvement, engineering business economics, law, and ethics. Interdisciplinary student teams will research, refine, and propose the design, manufacture, and marketing of a novel engineering product. Four hours of lecture. *Prerequisite: a course in probability of statistics.*

201. Venture Mechanics (4)
Examines the engineering/entrepreneurism interface. Discovery, development, and implementation of new product ideas. Understanding markets, competitors, and selling innovations. Cultivating effective working relationships between research, engineering, manufacturing, and marketing elements of an organization. Priority enrollment given to engineering majors.

202. Enterprise Dynamics (4)
Case studies of start-ups, strategic technology management, practice in use of industrial decision-making tools, and speakers from successful firms combined with experience in making management decisions dynamically in a competitive computer-simulated enterprise. Field study of ongoing processes in a local high technology company. Priority enrollment given to engineering majors.

203. Applied Innovations (4)
Course includes the examination of business plans developed by early stage technology businesses. Students expected to work on the development of business plans for real, innovative business organizations. Will explore all of the business research and analysis that needs to be undertaken in order to develop a complete business plan. Completion of ENG 201 or ENG 202 preferred.

204. Theory and Practice of University Teaching (2)
Teaching and learning at the college/university level. Readings in engineering and cognitive science, plus opportunities for teaching and evaluating college level students. Covers theoretical underpinnings and the practice of teaching. Participation in some practicum teaching experience will be required.

Applied Mechanics and Engineering Sciences (AMES)

Program name changed to *Mechanical and Aerospace Engineering (MAE).*

Bioengineering

STUDENT AFFAIRS:
141 Powell-Focht Bioengineering Hall,
Warren College
http://www-bioeng.ucsd.edu/homepage.html

Professors

S. Chien, M.D., Ph.D., *Chair, Director, Whitaker Institute for Biomedical Engineering*
Y. C. Fung, Ph.D., *Professor Emeritus*
W. R. Giles, Ph.D.
D. A. Gough, Ph.D.
M. J. Heller, Ph.D.
M. Intaglietta, Ph.D.
A. D. McCulloch, Ph.D., *Vice Chair*
B. O. Palsson, Ph.D.
R. L. Sah, M.D., Sc.D., *Vice Chair*
G. W. Schmid-Schoenbein, Ph.D.
S. Subramaniam, Ph.D.
J. T. Watson, Ph.D., *(In-Residence)*

Associate Professors

S. N. Bhatia, M.D., Ph.D.
L. A. Sung, Ph.D.

Assistant Professors

J. M. Hasty, Ph.D.
X. Huang, Ph.D.
G. A. Huber, Ph.D.
T. G. Ideker, Ph.D.
G. A. Silva, Ph.D. *(In-Residence)*

Adjunct Professors

M. W. Berns, Ph.D.
L. M. Bjursten, Ph.D.
C. R. Cantor, Ph.D.
J. A. Frangos, Ph.D.
D. J. Galas, Ph.D.
T. E. Hugli, Ph.D.
P. C. Johnson, Ph.D.
E. I. Ruoslahti, M.D., Ph.D.
P. Tong, Ph.D.
R. M. Winslow, Ph.D.

Assistant Adjunct Professor

D. A. MacKenna, Ph.D.

Affiliated Faculty

P. C. Chau, Ph.D., *Professor, Mechanical and Aerospace Engineering*
K. R. Chien, Ph.D., *Professor, Medicine*
J. W. Covell, M.D., *Professor Emeritus, Medicine*
M. H. Ellisman, Ph.D., *Professor, Neurosciences*
A. Fronek, M.D., Ph.D., *Professor Emeritus, Surgery*
R. L. Lieber, Ph.D., *Professor, Orthopaedics*
J. H. Omens, Ph.D., *Associate Adjunct Professor, Medicine*
K. L. P. Sung, Ph.D., *Professor In-Residence, Orthopaedics*
P. D. Wagner, M.D., *Professor, Medicine*
J. B. West, M.D., Ph.D., *Professor, Medicine*

Professional Research Staff

D. A. Baker, Ph.D., *Associate Research Scientist*
A. C. Chen, Ph.D., *Assistant Project Scientist*
P. C. Chen, Ph.D., *Associate Project Scientist*
S. Fukuda, Ph.D., *Assistant Project Scientist*
Y. L. Hu, Ph.D., *Assistant Project Scientist*
W. Huang, M.D., Ph.D., *Associate Project Scientist*
Y. S. Li, Ph.D., *Associate Project Scientist*
D. Lim, Ph.D., Sc.D., *Research Scientist*
M. T. Makale, Ph.D., *Associate Project Scientist*
H. Miao, Ph.D., *Assistant Project Scientist*
A. P. Mihaylova, Ph.D., *Assistant Research Scientist*
J. H. Price, M.D., Ph.D., *Associate Research Scientist*
A. G. Tsai, Ph.D., *Associate Research Scientist*
S. Usami, M.D., Ph.D., *Research Scientist*
T. Usyk, Ph.D., *Assistant Project Scientist*
N. Wang, M.D., *Assistant Research Scientist*
Y. H. Zhao, Ph.D., *Assistant Project Scientist*

Departmental Focus

Bioengineering is an interdisciplinary major in which the principles and tools of traditional engineering fields, such as mechanical, materials, electrical, and chemical engineering, are applied to biomedical problems. Engineering plays an increasingly important role in medicine in projects that range from basic research in physiology to advances in biotechnology and the improvement of health care delivery. By its very nature, bioengineering is broad and requires a foundation in the engineering sciences as well as in physiology and other biological sciences.

The overall mission of the Department of Bioengineering is to provide students with an education that enables successful, innovative, and lifelong careers in bioengineering industries and professions, including

- depth, breadth, and creativity in the central areas of bioengineering, its underlying mathematical, physical and biological sciences, and related technologies
- effective communication, learning, and teamwork skills that facilitate bioengineering practice, continued professional advancement, and adaptation
- a recognition of professional and social responsibilities, including sensitivity to ethical and health-related issues

At the undergraduate level, the department offers several four-year engineering majors. One leads to a **B.S. degree in Bioengineering**. This major prepares students for careers in the biomedical industry and for further education in graduate school. Students completing the B.S. degree in Bioengineering have sufficient preparation to be employed in traditional engineering areas other than the biomedical industry, if they wish. This program addresses the bioengineering topics of biomechanics, biotransport, bioinstrumentation, bioelectricity, biosystems, and biomaterials, and the complementary fields of systems and organ-level physiology. Education in these areas allows application of bioengineering and scientific principles to the development of medical devices and technologies that benefit human health by advancing methods for effective diagnosis and treatment of disease. The bioengineering program is accredited by the Engineering Accreditation Commission of the Accreditation Board for Engineering and Technology (EAC/ABET).

The department also offers a **B.S. degree in Bioengineering: Biotechnology**. This is a four-year engineering curriculum that prepares students for careers in the biotechnology industry and for further education in graduate school. The curriculum has a strong engineering foundation with emphasis on biochemical process applications. This program addresses the bioengineering topics of biochemistry and metabolism, kinetics, biotransport, biosystems, bioreactors, bioseparations, tissue engineering, and the complementary fields of cellular physiology. Education in these areas allows application of bioengineering and

physicochemical principles to cellular and molecular biology, with the applications that benefit human health. The Bioengineering: Biotechnology program is accredited by EAC/ABET.

In addition, the department offers a four-year major leading to a **B.S. degree in Bioengineering: Premedical.** This curriculum is designed to meet the requirements for admission to medical schools and is also suitable for those planning to enter graduate school in bioengineering, physiology, neurosciences, or related fields. This program provides a quantitative understanding of the engineering design of the body, as well as certain technologies used in medical practice. It has less engineering content but more biological sciences and is one of many majors that can serve as preparation for further training in medical, veterinary, or allied health professions. Some graduates of this program also go on to work in industry.

The department also offers a major leading to a **B.S. degree in Bioengineering: Bioinformatics.** Bioinformatics is the study of the flow of information (genetic, metabolic, and regulatory) in living systems to provide an understanding of the properties of cells and organisms. This major has been developed by the Departments of Bioengineering, Chemistry and Biochemistry, Computer Science and Engineering, and the Division of Biology. Students wishing to major in bioinformatics may apply through any of these departments or the division. The Bioinformatics major in Bioengineering emphasizes systems engineering and model-based approaches to interpreting and integrating bioinformatics data. The Bioinformatics major prepares students for careers in the pharmaceutical, biotechnology, and biomedical software industries, and for further studies in graduate school.

The programs and curricula of bioengineering emphasize education in the fundamentals of engineering sciences that form the common basis of all engineering subspecialties. Education with this emphasis is intended to provide students with a solid engineering foundation for a career in which engineering practice may change rapidly. In addition, elements of bioengineering design are incorporated at every level in the curricula. This is accomplished by integration of laboratory experimentation, computer applications, and exposure to real bioengineering problems throughout the program. Students also work as teams in senior design project courses to solve multidisciplinary bioengineering problems suggested by industrial and clinical experience.

At the graduate level, specialized curricula lead to the **M.S., M.Eng. (Master of Engineering),** and **Ph.D.** degrees, as well as an integrated **B.S./M.S.** degree. In addition to the Ph.D. degree, the department offers a **Ph.D. degree with a specialization in Bioinformatics.** It is intended for students who have an interdisciplinary persuasion to work across computers, biology, medicine, and engineering. Bioinformatics characterizes the flow of information in living systems. For further information on the specialization please consult with the Student Affairs Office. There are also **M.D./M.S., M.D./M.Eng.** and **M.D./Ph.D.** degrees offered in conjunction with UCSD Medical School, pending independent admission to the Medical School. The M.Eng. degree is a terminal professional degree whereas the M.S. and Ph.D. degrees are research programs. *(See section on master's degree programs.)* The graduate programs are characterized by strong interdisciplinary relationships with the other engineering departments and Departments of Physics, Mathematics, Biology, Chemistry and Biochemistry, Medicine, and others, as well as with campus organizations such as the Whitaker Institute for Biomedical Engineering, Institute for Mechanics and Materials, and the School of Medicine.

The Undergraduate Program

Major Requirements

Specific course requirements for each of the majors are outlined in tables below. In addition to the required technical courses specifically indicated, a suggested scheduling of humanities and social science courses (HSS) are included in the curricula for students to use to meet college general-education requirements. To graduate, students must maintain an overall GPA of at least 2.0, and obtain at least a C– grade in each course required for the major. All courses required for the major must be taken for a letter grade.

Deviations from the required programs of study must be approved by the Undergraduate Studies Committee *prior* to taking alternative courses. In addition, students must obtain departmental approval of technical elective (TE) course selections *prior* to taking the course. In the ABET-accredited programs, TE courses are restricted to those that meet ABET standards. Courses such as Bioengineering 196, 197, and 198 are encouraged, but they do not count as upper-division technical electives. Bioengineering 195 and 199 can be used as technical electives under certain conditions. Policy information may be obtained from the Student Affairs Office.

Students with accelerated academic preparation at admission to the university may vary the scheduling of lower-division courses such as mathematics, physics, and chemistry, but must first consult the department. Most lower-division courses are offered more than once each year to permit students some flexibility in their program scheduling. However, most Bioengineering upper-division courses are taught only once each year. **Deviations in the scheduling of upper-division bioengineering courses are strongly discouraged, as such changes usually lead to a delay in graduation.** The curricula shown in the tables below are consistent with the current scheduling of classes.

Minors are not offered in bioengineering, and double major options are restricted. Students interested in double majors should consult the Student Affairs Office as early as possible.

General-Education/ College Requirements

For graduation, each student must satisfy general-education course requirements determined by the student's college, as well as the major requirements determined by the department. The six colleges at UCSD require different general-education courses, and the number of such courses differs from one college to another. Each student should choose his or her college carefully, considering the special nature of the curriculum and the breadth of general education.

The bioengineering programs allow for humanities and social science (HSS) courses so that students can fulfill their college requirements. In the bioengineering ABET-accredited programs, students must develop a program that includes a total of at least twenty-four units in the arts, humanities, and social sciences, not including subjects such as accounting, industrial management, finance, or personnel administration. It should be noted, however, that some colleges require more than the ten HSS courses indicated in the *Bioengineering, Bioengineering: Biotechnology, and Bioengineering: Bioinformatics* curriculum tables. Accordingly, students in these colleges may take longer to graduate than the four years, indicated in the schedule. Students

must consult with their colleges to determine which HSS courses to take.

BIOENGINEERING
(ABET-Accredited Program)

FALL	WINTER	SPRING
FRESHMAN YEAR		
Math. 20A	Math. 20B	Math. 20C
Chem. 6A	Chem. 6B	BILD 1
MAE 9 or 10	Phys. 2A	Phys. 2B/2BL
HSS[4]	BENG 1[2]	Chem. 6BL[1]
	HSS[4]	HSS[4]
SOPHOMORE YEAR		
Math. 20D	Math. 20F	Math. 20E
MAE 130A/SE 101A	MAE 140	MAE 3
Phys. 2C/2CL	BENG 106B	BENG 100
HSS[4]	HSS[4]	HSS[4]
JUNIOR YEAR		
BENG 101	BENG 112A	BENG 112B
BENG 110	BENG 186B	BENG 172
MAE 170	BENG 140A	BENG 140B
HSS[4]	HSS[4]	BENG 103B
SENIOR YEAR		
BENG 186A	BENG 122A	BENG 125
MAE 105	BENG 130	BENG 186C
HSS[4]	MAE 150	TE[3]
	TE[3]	HSS[4]
	BENG 191[5]	

[1] Chem. 6BL may be taken in any quarter within the first two years after completion of Chem. 6B.

[2] BENG 1 may be taken in sophomore year.

[3] Technical electives (TE) courses must be selected from a departmental approved list. Consult the Student Affairs Office.

[4] Ten HSS courses are listed here; individual college requirements may be higher.

[5] Recommended course, not required. For graduating seniors only.

BIOENGINEERING: BIOTECHNOLOGY
(ABET-Accredited Program)

FALL	WINTER	SPRING
FRESHMAN YEAR		
Math. 20A	Math. 20B	Math. 20C
Chem. 6A	Chem. 6B	Chem. 6BL[1]/6C
MAE 9 or 10	Phys. 2A	Phys. 2B
HSS[4]	BENG 1[2]	HSS[4]
	HSS[4]	
SOPHOMORE YEAR		
Math. 20D	Math. 20F	Math. 20E
Chem. 140A	Phys. 2C/2CL	Chem. 140B
BILD 1	BENG 130	BENG 100
HSS[4]	HSS[4]	HSS[4]
JUNIOR YEAR		
BIBC 100	BIBC 102	BIBC 103
CENG 101A	BICD 100	BENG 103B
MAE 140	BENG 123	BENG 168
HSS[4]	HSS[4]	HSS[4]
SENIOR YEAR		
BENG 161A	BENG 161B	BENG 125
BENG 166A	BENG 162	BENG 161C
BENG 186A	BENG 191[5]	BENG 164
MAE 170	TE[3]	TE[3]
	HSS[4]	

[1] Chem. 6BL may be taken concurrently with Chem. 6C or in any quarter within the first two years after completion of Chem. 6B.

[2] BENG 1 may be taken in sophomore year.

[3] Technical electives (TE) courses must be selected from a departmental approved list. Consult the Student Affairs Office.

[4] Ten HSS courses are listed here; individual college requirements may be higher.

[5] Recommended course, not required. For graduating seniors only.

BIOENGINEERING: PREMEDICAL

FALL	WINTER	SPRING
FRESHMAN YEAR		
Math. 20A*	Math. 20B*	Math. 20C*
Chem. 6A*	Chem. 6B	Chem. 6BL[1]/6C
MAE 9 or 10*	Phys. 2A*	Phys. 2B*/2BL
HSS[4]	BENG 1[2]	HSS[4]
	HSS[4]	
SOPHOMORE YEAR		
Math. 20D	Math. 20F	Math. 20E
BILD 1	BILD 2	BENG 100
Phys. 2C/2CL	Chem. 140A	Chem. 140B
HSS[4]	HSS[4]	HSS[4]
JUNIOR YEAR		
BENG 110	BENG 112A	BENG 112B
Chem. 140C[5]	BICD 100	BIBC 100
Chem. 143A	MAE 140	MAE 170
HSS[4]	HSS[4]	HSS[4]
SENIOR YEAR		
BENG 186A	BENG 186B	BENG 172
BIPN 140	BIPN 100	BIPN 102
TE[3]	TE[3]	TE[3]
HSS[4]	HSS[4]	HSS[4]

* Seven of the eight courses used to compute the performance index upon which Pre-Bioengineering: Premedical majors are admitted to the major at the end of the freshman year. The other course must be in engineering, science, or mathematics.

[1] Chem. 6BL may be taken concurrently with Chem. 6C or in any quarter within the first two years after completion of Chem. 6B.

[2] BENG 1 may be taken in sophomore year.

[3] Technical electives (TE) courses must be selected from a departmental approved list. Consult the Student Affairs Office.

[4] Twelve HSS courses are listed here; individual college requirements may be higher.

[5] Chem. 140C is not required for the major and can be used as a technical elective. Chem. 140C is a requirement for application to most medical schools.

BIOENGINEERING: BIOINFORMATICS

FALL	WINTER	SPRING
FRESHMAN YEAR		
BILD 3	BILD 1	BILD 2
Chem. 6A	Chem. 6B	BILD 94
Math. 20A	Math. 20B	Chem. 6BL[1]/6C
HSS[4]	HSS[4]	Math. 20C
		HSS[4]
SOPHOMORE YEAR		
CSE 11[2]	CSE 12	CSE 21/
Math. 20D	Chem. 140A	Math. 15B
Phys. 2A	Phys. 2B	Chem. 140B
HSS[4]	HSS[4]	Phys. 2C
		HSS[4]
JUNIOR YEAR		
BICD 102/Chem. 114B	BIMM 100/	BICD 110
BICD 100	Chem. 114C	BIMM 101/
CSE 100/Math. 176	CSE 101/	Chem. 112B
Phys. 140A	Math. 188	BENG 181
	CSE 101/	HSS[4]
	Math. 20F	
	Math. 186	
SENIOR YEAR		
BENG 182	BENG 130	BENG 161C
BENG 183	BENG 184	BIMM 185
BIBC 103	TE[3]	HSS[4]
HSS[4]	HSS[4]	

[1] Chem 6BL may be taken concurrently with Chem. 6C or in any quarter within the first two years after completion of Chem 6B.

[2] Students may take the slower paced version, CSE 8A-B, instead of CSE 11.

[3] Technical elective (TE) courses must be selected from a departmental approved list. Consult the Student Affairs Office.

[4] Ten HSS courses are listed here; individual college requirements may be higher.

Policies and Procedures

Transfer Student Admission into Bioengineering, Bioengineering: Biotechnology, Bioengineering: Premedical, or Bioengineering: Bioinformatics

Effective **fall 2004**, it is **strongly recommended** that transfer students complete the following preparation for engineering majors*:

- Calculus I—for Science and Engineering (Math. 20A)
- Calculus II—for Science and Engineering (Math. 20B)
- Calculus and Analytic Geometry (Math. 20C)
- Differential Equations (Math. 20D)
- Linear Algebra (Math. 20F)
- Complete calculus-based physics series with lab experience (Physics 2A-B-C)

- Chemistry 6A (except Computer Science and Computer Engineering majors)
- Highest level of introductory computer programming language course offerings at the community college**

*Effective **fall 2006**, these courses will be **required** preparation for all engineering transfer students.

**Refer to the *UCSD General Catalog* to select major prerequisite requirement for computer language courses.

ADMISSION TO BIOENGINEERING OR BIOENGINEERING: BIOTECHNOLOGY

Because of heavy student interest in the Bioengineering and Bioengineering: Biotechnology majors, and the limited resources available to accommodate this demand, maintenance of a high quality program makes it necessary to limit enrollments to the most qualified students.

Freshman Students

Freshman students who have excelled in high school and have declared Bioengineering or Bioengineering: Biotechnology on their UCSD application are eligible for direct admission into those majors. These students will be notified directly by the Jacobs School of Engineering whether they have been admitted into their chosen major, based on admissions criteria and their ranking in the applicant pool. The only way for a student to become a Bioengineering or Bioengineering: Biotechnology major after enrolling as a freshman at UCSD is to be directly admitted at the time of entrance into UCSD.

Transfer Students

Admission of transfer applicants into Bioengineering or Bioengineering: Biotechnology is limited to those who have demonstrated a high level of achievement commensurate with the prospect of success in these majors. Successful applicants must have completed substantial training at the community college and must have achieved a high level of academic performance there. The required minimum of ninety quarter transfer units must include eighteen quarter-units of calculus, twelve quarter-units of calculus-based physics, and the highest level computer science course offered at their community college. Beginning fall 2006, ten quarter units of general chemistry (including laboratory), will be part of the required transfer units.

Applicants seeking admission as transfer students will be considered for direct admission into the Bioengineering and Bioengineering: Biotechnology majors in the Department of Bioengineering. The only way to become a Bioengineering or Bioengineering: Biotechnology major is to be directly admitted as an entering transfer student. Although the actual required GPA cutoff depends on the number of openings, at least a 3.2 GPA in the community college transfer courses, and a 3.4 GPA in math, physics, and computer science courses, are likely to be needed to gain admission.

ADMISSION TO BIOENGINEERING: PREMEDICAL

Freshman Students

Students intending to complete a Bioengineering: Premedical major are initially identified as Pre-Bioengineering: Premedical majors and admitted into a pre-major status. Pre-Bioengineering: Premedical majors who have achieved a GPA of 3.0 or better in the eight required premajor courses (Mathematics 20A-B-C; Physics 2A-B; Chemistry 6A; MAE 9 or 10, and one other pre-bioengineering course by the end of the freshman year) are assured of admission into the Bioengineering: Premedical major. Students who have not completed the pre-major courses or achieved the necessary GPA for entry into the Bioengineering: Premedical major by the end of the freshman year may still enter the Bioengineering: Premedical major if these requirements have been satisfied before the end of the sixth quarter of study at UCSD. Students need to contact the Student Affairs Office at the end of the appropriate quarter to check on their status and complete an Undergraduate Change of Major Request form. Pre-Bioengineering: Premedical majors not admitted into the Bioengineering: Premedical major by the end of the sixth quarter of study at UCSD will automatically have their major converted from "Pre-Bioengineering: Premedical" to "Undeclared" by the department.

Transfer Students

Students are initially identified as "pre-majors", and will be admitted to the Bioengine-ering: Premedical major based on academic performance in ten prerequisite courses. It is expected that students will have completed or have in progress all ten prerequisite courses when applying to UCSD. Students are required to achieve a GPA of 3.0 or better in the ten prerequisite premajor courses (Mathematics 20A-B-C; Physics 2A-B; Chemistry 6A; MAE 9 or 10, and three other courses required by the major) by the end of the third quarter of study at UCSD. **Note**: *Two of the prerequisite courses must be taken at UCSD, one of which must be an upper-division course.* Students need to contact the Student Affairs Office at the end of their third quarter at UCSD to check on their status and complete an Undergraduate Change of Major Request form.

ADMISSION TO BIOENGINEERING: BIOINFORMATICS

As the number of pre-majors and majors will be limited as described in the catalog section on Bioinformatics, student demand may exceed program capacity. Therefore, admission to the major is not guaranteed and will be based on academic excellence, as described below. Since Bioinformatics is an interdisciplinary major, a Steering Committee involving faculty from the participating departments will select among the best candidates applying and recommended through each department, while insuring active participation of the departments and division offering the major.

Freshman Students

Bioengineering: Bioinformatics has been recently developed, and there is a multi-step process into this major for students entering UCSD as freshmen. First, high school students should apply to UCSD for direct admission into the Bioengineering, Bioengineering: Biotechnology, or Pre-Bioengineering: Premedical major. Those admitted should then complete the freshman courses, prescribed in the preceding Table for the Bioengineering: Bioinformatics major. After completing BILD 1, Chem. 6A, Math. 20B, and Math. 20C during the freshman year, such students can apply to Pre-Bioengineering: Bioinformatics. Admission will be based primarily on the GPA in the four preceding courses, but also on a written statement, completion of the other listed requirements, and overall academic excellence. Students approved for Pre-Bioengineering: Bioinformatics should then continue with the sophomore courses, prescribed in the preceding Table, including CSE 11 and 12 which serve as two additional screening courses. By the end of the sophomore year, these students can then apply to major in Bioengineering:

Bioinformatics. Admission to the Bioengineering: Bioinformatics major will be based on the GPA in all six screening courses. The final decision on admission to the pre-major and major will be made by the Bioinformatics Steering Committee, in consultation with the departments. Those students who are not selected for the Bioengineering: Bioinformatics major, will be eligible to remain in the Department of Bioengineering in the status in which they were originally admitted.

Continuing Students

Students who have not declared the Pre-Bioengineering: Bioinformatics major, but who have completed the screening courses for the Bioengineering: Bioinformatics major, may apply for entry to the program after six quarters (the end of sophomore year). Students will be admitted on a space-available basis, after pre-majors have been screened for admission to the major.

Transfer Students

As Bioengineering: Bioinformatics has been recently developed, there is a multi-step process into this major for transfer students. First, such students should complete at their community colleges as many of the following courses as possible, with a strong GPA that is competitive with that of UCSD students applying for entry into this major. The required courses include a year of calculus (equivalent to Math. 20A, 20B, and 20C), two quarters of biology (equivalent to BILD 1 and 2), a year of general chemistry with laboratory (equivalent to Chem. 6A, 6B, 6C, and 6BL), and the highest level programming courses (equivalent to CSE 11 and 12). Next, such students should apply to UCSD for direct admission into the Bioengineering, Bioengineering: Bio-technology, or Pre-Bioengineering: Premedi-cal major. After completing the necessary screening requirements equivalent to those that apply for students entering UCSD as freshmen, such students can apply to Pre-Bioengineering: Bioinformatics and subsequently apply to major in Bioengineering: Bioinformatics. Admission will be based primarily on the GPA in the required screening courses, but also on a written statement, completion of the other listed requirements and overall academic excellence. The final decision on admission to the pre-major and major will be made by the Bioinformatics Steering Committee, in consultation with the departments. Those who are not selected for the Bioengineering: Bioinformatics major, will be eligible to remain in the Department of Bioengineering in the status in which they were originally admitted.

ACADEMIC ADVISING

Upon admission to the major, students are encouraged to seek advice from departmental staff in the Bioengineering Student Affairs Office, Room 141, Powell-Focht Bioengineering Hall, to plan a program of study. Students are expected to chart their progress within their major. The program plan may be revised in subsequent years, but revisions involving curricular requirements require approval of the undergraduate adviser and the Undergraduate Studies Committee. As the department may make a small number of course and/or curricular changes every year, it is imperative that students consult the undergraduate adviser on an annual basis.

To enroll in any courses required for a bioengineering major, a student must have satisfied prerequisite courses with a C– or better. (The department does not consider D or F grades as adequate preparation for subsequent material.) Furthermore, the majority of bioengineering courses have enrollment restrictions and are open only to students who have been admitted to a bioengineering pre-major or major. Where these restrictions apply, the registrar will not enroll other students except by department approval. The department expects students to adhere to these policies and enroll in courses accordingly. Students are advised that they may be dropped from course rosters if prerequisites and/or performance standards have not been met.

Bioengineering courses are typically offered only once a year and therefore should be taken in the recommended sequence. If courses are taken out of sequence, it may not always be possible to enroll in courses as desired or needed for timely graduation. If this occurs, students should seek immediate departmental advice.

Programmatic advice may be obtained from the Student Affairs Office. In addition, technical advice may be obtained from a specific bioengineering faculty adviser assigned to each student upon admission to the major.

PROGRAM ALTERATIONS, EXCEPTIONS TO REQUIREMENTS, AND SPECIAL PROGRAMS

Exceptions to any program or course requirements are possible if approved by the Undergraduate Studies Committee *before* the courses in question are taken. Petitions may be obtained from the Bioengineering Student Affairs Office.

Independent Study for Undergraduates

Under the guidance of a bioengineering faculty member, lower- and upper-division level bioengineering students have opportunities to participate in independent study and research.

Upper-division bioengineering students may take Bioengineering 199, Independent Study for Undergraduates. Lower-division bioengineering students may enroll in Bioengineering 99 which is similar to Bioengineering 199, except that less background in the curriculum is needed. These courses are taken as electives on a P/NP basis. Under certain conditions, however, a Bioengineering 199 course may be used to satisfy upper-division technical elective course requirements for the major. Students interested in this alternative must identify a faculty member with whom they wish to work and propose a two-quarter research or study topic for *Bioengineering* (the other technical elective must be an engineering course) and *Bioengineering: Biotechnology* majors, and a one-quarter research topic for *Bioengineering: Premedical* majors. After obtaining the faculty adviser's concurrence on the topic and scope of the study, the student must submit a *Special Studies* course form (each quarter) and a *Bioengineering 199 as Technical Elective Contract* to the Undergraduate Studies Committee. These forms must be completed, approved, and processed prior to the beginning of the quarter in which the course is to be taken.

Teaching

Students interested in participating in the instructional activities of the department may take Bioengineering 195, Undergraduate Teaching as an elective on a P/NP basis. Under certain conditions, it may be used to satisfy upper-division technical elective course requirements for the *Bioengineering: Premedical* major. Policy in this regard may be obtained from the Student Affairs Office.

Integrated Bachelor's/ Master's Degree Program

An integrated program leading to a bachelor of science and a master of science degree in bioengineering is offered to undergraduate students who are enrolled in any of the major programs offered by the Department of Bioengineering. Students interested in obtaining the

M.S. degree within one year following completion of the B.S. degree may apply to the department for admission to the program during the fourth quarter *prior* to the receipt of the B.S. degree. The program is open only to UCSD undergraduates.

To be eligible, students must have completed the first two quarters of their junior year in residence at UCSD and have an upper-division GPA of 3.5 or better and a 3.0 overall UC GPA. Twelve units of bioengineering graduate level courses must be completed during the student's senior undergraduate year, *in addition* to the requirements for the bachelor's degree; these twelve units will count toward the requirements for the master's degree only and must be taken for a letter grade. It is the responsibility of the prospective B.S./M.S. student to select a bioengineering faculty member who is willing to serve as the student's adviser. The student will also arrange (with their faculty adviser's approval) a schedule of courses for the senior year that will fulfill the requirements for the B.S. degree while also serving the program planned for the M.S. degree. Students are expected to meet the requirements for the M.S. degree in one year (three consecutive academic quarters) from the date of the receipt of the B.S. degree.

Industrial Internship Program and Graduate Industrial Training Program

The Department of Bioengineering offers two industrial programs: the **Industrial Internship Program** for undergraduates and the **Graduate Industrial Training Program** for graduate students. Both industrial programs are designed to complement the department's academic curriculum with practical industry experience. Students interested in these programs should contact the Bioengineering Industrial Internship Office (125 Powell-Focht Bioengineering Hall) well in advance of the quarter in which they would like to start their internship.

The Industrial Internship Program is available to undergraduate students who have completed all lower-division course requirements. Academic credit under Bioengineering 196, Bioengineering Industrial Internship can be earned by spending ten weeks or more as interns in an industrial setting. The intern may be involved in a range of activities including design, analysis, manufacturing, testing, regulatory affairs, etc., under the direction of a mentor in the workplace. At the completion of the internship experience, students are required to submit a brief report to the mentor and faculty adviser describing their activities.

The Graduate Industrial Training Program is designed for students in the Master of Engineering Degree Program. This program serves to significantly enhance the professional development of M.Eng. students in preparation for leadership in the bioengineering industry. Students will complete an independent industrial bioengineering project in the setting of a company under the direction of an industrial and faculty adviser.

The Graduate Program

Admission to the M.Eng. M.S., and Ph.D., as well as to the Ph.D. with a specialization in bioinformatics programs, is in accordance with the general requirements of the graduate division. Applicants are required to have completed a B.S. and/or M.S. degree by time of admission in a branch of engineering, natural sciences, mathematics, or quantitative life sciences. M.S. and Ph.D. applicants must have a GPA of 3.4 or better in technical courses. M.Eng. applicants should have competitive grades (greater than a 3.0 GPA). All applicants must submit GRE General Test scores, as well as three letters of recommendation from individuals who can attest to the academic or professional competence and to the depth of their interest in pursuing graduate study. Attention will be paid to the background and statement of purpose to ensure that they are consistent with the goals of the program. For example, whereas undergraduate research experience and the intention to pursue a research career or advanced studies are qualifications and interests typically well-suited to the M.S. program, industrial experience and the intention to pursue a professional career are better suited to the M.Eng. program.

A minimum score of 550 (paperbased) or 213 (computer based) on the Test of English as a Foreign Language (TOEFL) is required of all international applicants whose native language is not English and whose undergraduate education was conducted in a language other than English. Students who score below 600 on the TOEFL examination are strongly encouraged to enroll in an English as a Second Language program before beginning graduate work. (UCSD Extension offers an English language program during the summer as well as the academic year.) Admission to the M.S. or Ph.D. is designated when the applicants are judged to be appropriately qualified to pursue the degree requested at the time of application. Applicants are considered for admission for the fall quarter only.

A new graduate student who does not meet the prerequisites of required courses in the M.Eng., M.S., or Ph.D. curricula may have to take some basic courses to make up the deficiency. Thus, a student deficient in mathematics and mechanics may have to take Math. 110, CENG 103B or Bioengineering 103B, Bioengineering 110, 122A-B in the first year and Bioengineering 250A-B, 253 in the second year. A student deficient in biology and chemistry may have to take Chemistry 131 or Bioengineering 130 and BIPN 100, 102 in the first year and Bioengineering 230A-B-C in the second year.

Non-matriculated students are welcome to seek enrollment in bioengineering courses via UCSD Extension's concurrent registration program, but such enrollment in a bioengineering graduate course must be approved by the instructor.

Master of Science Degree Programs

The Master of Science **(M.S.) program** is intended to extend and broaden an undergraduate background and equip the graduates with fundamental knowledge in bioengineering. It is intended for those students wishing to gain experience in academic research, especially those considering continuing graduate studies at the doctoral level. The M.S. degree may be terminal or may be obtained on the way to the Ph.D. or by completing the course requirements of the M.S. degree and by passing the Ph.D. departmental examination.

An individualized program is agreed upon by the student and a faculty adviser. The plan of study must involve both course work and research, culminating in the preparation of a thesis.

A total of **forty-eight units** of credit is required:

- **Thirty-six units in course work**
  Nine courses, of which six are core courses, described below, and three are elective courses which can be drawn from Bioengineering course offerings, other engineering/science course offerings, and School

of Medicine courses. *The faculty adviser must approve the three elective courses.*

- **Twelve units in research**
  Bioengineering Research (BENG 299) under the direction of the chosen faculty research adviser.

A thesis based on the research is written and subsequently reviewed by the thesis adviser and two other faculty members appointed by the dean of Graduate Studies. The oral defense of the thesis constitutes the departmental master's exam.

REQUIRED CORE COURSES FOR M.S. DEGREE PROGRAM

Integrative Bioengineering

- BENG 250A. Biomechanics
- BENG 253. Biomedical Transport Phenomena
- A third required course chosen from a list of approved courses that satisfy the Integrative Bioengineering requirement i.e., Advanced Biomechanics 250B, Biomedical Imaging BENG 280B, Bioinformatics III—Genomic Analysis BENG 203, or other core Bioengineering graduate courses that satisfy the Integrative Bioengineering requirement as approved by the Graduate Studies Committee. A list of applicable approved courses is available from the Department of Bioengineering Student Affairs Office.

Life Science

- BENG 230A. Biochemistry
- BENG 230B. Cell and Molecular Biology
- BENG 230C. Cardiovascular Physiology

Restrictions to core course work requirements are as follows:

1. Units obtained in Bioengineering 281, or 299 or 501 may not be applied toward the course work requirement.
2. No more than a total of eight units of Bioengineering 296 and 298 may be applied toward the course work requirement.
3. No more than twelve units of upper-division 100-level Bioengineering courses may be applied toward the course work requirement.

Students must maintain at least a B average in the courses taken to fulfill the degree requirements.

MASTER'S TIME LIMIT POLICY

Full-time M.S. students are permitted seven quarters in which to complete all requirements. While there are no written time limits for part-time students, the department has the right to set individual deadlines if necessary.

A strong effort is made to schedule M.S.–level course offerings so that students may obtain their M.S. degree in one year of full-time study or two years of part-time study *(see regulations on part-time study under "Graduate Studies")*. Entering students who do not meet the prerequisites of these core courses may have to take some basic courses to make up the deficiency.

A candidate admitted for the M.S. degree who wishes to transfer to the Ph.D. program must consult the Student Affairs Office for the transfer before completion of the M.S. program.

CHANGE OF DEGREE AIM

Upon completion of the requirements for the M.S. degree, students are not automatically eligible for admission to the Ph.D. program.

M.S. candidates who wish to pursue a doctorate must submit an application for a change in status to the Graduate Studies Committee. The application must be approved and signed by a bioengineering faculty member who expects to serve as the student's Ph.D. adviser. Applications will be reviewed by an ad hoc faculty committee. If the committee recommends that the student has good potential for success in the doctoral program, the student will be given the opportunity to take an oral examination equivalent to the Ph.D. Departmental Qualifying Examination. At the time of that exam, an assessment will be made on admission to the Ph.D. program.

A change of status from a master's program to the doctoral program requires that the student meet the minimal grade-point average required by the department of doctoral candidates.

Master of Engineering Degree Program

The department offers a Master of Engineering **(M.Eng.) degree**. The purpose of this degree is to prepare design and project engineers for careers in the biomedical and biotechnology industries within the framework of the graduate program of the Department of Bioengineering. It is a terminal professional degree in engineering which includes a recognition of the importance of breadth in technical knowledge, sufficient electives to address job-specific interests and professional skills such as economics, management, and business. It is intended for students who are primarily interested in engineering design, development, manufacturing, and management within an industrial setting.

The M.Eng. program is a flexible, course-intensive terminal professional degree, designed to be completed in one academic year of full-time study. It does not require a research project, a thesis, or a comprehensive exam. However, students do have the option in enrolling for technical credit in BENG 295 *Bioengineering Design Project and Industrial Training* under the direction of a faculty adviser. This is done by participating in the Graduate Industrial Training Program which allows students to work in an industrial setting on bioengineering projects in order to gain practical experience. *(See section on **Industrial Internship Program** and **Graduate Industrial Training Program**.)* Students who may be interested in continuing to the Ph.D. program should apply to the M.S. program and not the terminal M.Eng. degree.

Students must select **six** courses from approved core areas, **three** additional approved technical elective courses from any graduate engineering program, and **three** general elective courses which may be drawn from the Bioengineering core areas, engineering technical electives or other non-technical courses. Such core courses and technical and general electives are described below. In selecting breadth courses, students must be mindful of the prerequisite requirements for some of the courses in the lists. The lists below are based on the current graduate course offerings of the bioengineering and other engineering departments. The Graduate Studies Committee will review the M.Eng. course lists annually and update them as course offerings change. Students must maintain at least a B average in the courses taken to fulfill the degree requirements.

Required Core Courses for M.Eng. Program (Six Required)

- Biomechanics and Transport Phenomena—BENG 250A-B, 253
- Tissue Engineering—BENG 241A-B-C
- Life Science—BENG 230A-B-C
- Other approved core graduate courses taught by Bioengineering faculty that satisfy the depth requirement of the M. Eng. degree as approved by the Graduate Studies Committee. A list of applicable approved courses is

available from the Department of Bioengineering Student Affairs Office.

Examples of Technical Electives for M.Eng. (Three Required)

BENG 295. Bioengineering Design Project (two-quarters, four units each)
MAE 231A-B-C. Solid Mechanics
MAE 210A-B-C. Fluid Mechanics
MAE 221A-B-C. Heat and Mass Transfer
MAE 229A. Mechanical Properties
CSE 202. Algorithm Design and Analysis
CSE 210. Principles of Software Engineering
CSE 250A. Artificial Intelligence
ECE 239. Nanometer-Scale Probes and Devices
ECE 251AN, BN. Digital Image Processing and Analysis

Examples of General Electives for M.Eng. (Three Required)

BENG 161A-B-C. Biochemical Engineering
BENG 186A-B-C. Principles of Biomaterials, Bioinstrumentation and Bioengineering Design.
IR/PS Management: IRGN 438, 439, 442, 444, 445, 420, 434, IRCO 420, 421
IR/PS International Issues: IRCO 401, IRGN 407, 411, 413, 418
MAE 133. Finite Element Method
Phys. 206. Biophysics

Sample M.Eng. Program of Study

FALL	WINTER	SPRING
BENG 230A	BENG 230B	BENG 230C
Tech Elec	BENG 250A	BENG 250C
Gen Elec	BENG 253	Tech Elec
Gen Elec	Tech Elec	Gen Elec

Doctoral Degree Program

The Bioengineering Ph.D. Program is intended to prepare students for a variety of careers in research and teaching. Therefore, depending on the student's background and ability, research is initiated as soon as possible. Bioengineering students have specific course requirements and must maintain a minimum grade-point average of 3.4 in these courses. Students, in consultation with their advisers, develop course programs that will prepare them for the Departmental Qualifying Examination and for their dissertation research. These programs of study and research must be planned to meet the time limits established to advance to candidacy and to complete the requirements for the degree. Doctoral students who have passed the Departmental Qualifying Examination may take any course for an S/U grade with the exception of courses required by the Departmental or Senate Qualifying Examination Committee. It is recommended that all bioengineering graduate students take a minimum of two courses (other than research) per academic year after passing the Departmental Qualifying Examination. Details can be obtained from the Student Affairs Office.

Doctoral Examinations

A bioengineering Ph.D. student is required to pass three examinations. The first is a Departmental Qualifying Examination which must be taken immediately following the candidate's first academic year of enrollment. The exam is designed to ensure that all successful candidates possess a firm command of the engineering and life science subjects that form the foundations of bioengineering research and their integration at a level appropriate for the doctorate. It is administered by a committee designated by the department, consisting of departmental faculty members and, in some cases, one other faculty member from a related academic department (e.g., MAE, ECE, Medicine). The scope of the oral examination includes the three broad areas that form the core first-year Ph.D. curriculum, namely engineering foundations, life science, and integrative bioengineering. The purpose of the exam is not merely to recapitulate the content of first-year courses, but rather to establish that students are able to synthesize this knowledge and apply it to solve problems in contemporary bioengineering research.

1. **Engineering Foundations**

Defined by the content of three graduate engineering courses drawn from the following:

BENG 202/CSE 257A. Bioinformatics II: Sequence and Structure Analysis
BENG 203. Bioinformatics III:Genomic Analysis
BENG 209/MAE 209. Continuum Mechanics Applied to Medicine/Biology
BENG 275. Computational Biomechanics
BENG 280A. Principles of Biomedical Imaging
CSE 202. Algorithm Design and Analysis
ECE 222A. Applied Electromagnetic Theory
ECE 238A. Thermodynamics of Solids
ECE 247A/BENG 247A. Advanced Biophotonics
ECE 247B/BENG 247B. Bioelectronics
ECE 247C/BENG 247C. Bionanotechnology
ECE 251AN. Digital Signal Processing
ECE 270A-B-C. Neurocomputing
MAE 210A. Fluid Mechanics (best suited to students with some undergraduate background in mechanics or mechanical engineering)
MAE 221A. Heat and Mass Transfer
MAE 223. Computational Fluid Dynamics
MAE 231A. Foundations of Solid Mechanics (best suited to students with some undergraduate background in mechanics or mechanical engineering)
MAE 233A. Fracture Mechanics
MAE 252. Chemical Reaction Engineering
MAE 280A. Linear Systems Theory
MAE 281A. Nonlinear Systems
MAE 290A. Numerical Methods in Science and Engineering
MATS 201B. Solid State Diffusion and Reaction Kinetics

Other topics may be approved by the Graduate Studies Committee

2. **Integrative Bioengineering**

Defined by the content of the following three bioengineering courses:

- BENG 250A. Biomechanics
- BENG 253. Biomedical Transport Phenomena
- A third required course chosen from a list of approved courses that satisfy the Integrative Bioengineering requirement i.e., Advanced Biomechanics BENG 250B, Biomedical Imaging BENG 280B, Systems Biology and Bioengineering: Building-In-Silico models BENG 213, or other core Bioengineering graduate courses that satisfy the Integrative Bioengineering requirement as approved by the Graduate Studies Committee. A list of applicable approved courses is available from the Department of Bioengineering Student Affairs Office.

3. **Life Science**

The life science subject area consists of the following topics: biochemistry, cell and molecular biology, organ physiology, and tissue engineering. These subject areas are defined by the contents of the following four courses:

- BENG 230B. Cell and Molecular Biology

- BENG 230C. Cardiovascular Physiology or BENG 230D. Respiratory and Renal Physiology
- BENG 241A. Foundations of Tissue Engineering
- BENG 230A. Biochemistry or CHEM 211. Metabolic Biochemistry

In addition to the above mentioned breadth requirements, students must complete the following courses in their second and subsequent years of study:

- At least two courses from an approved list that includes the continuation of Bioengineering Foundations course sequences, BENG 230D, Pharm. 201, Math. 283, and other bioengineering graduate course sequences.
- One quarter of BENG 501, Teaching Experience
- BENG 281, Seminar in Bioengineering (F,W,S)

Courses comprising subject areas as well as subsequent requirements, and composition of the examination committee must be approved by the Graduate Studies Committee. Students are advised to seek such approval well in advance of their expected examination date, preferably while planning graduate studies.

Teaching Experience is required of all bioengineering Ph.D. students prior to taking the Senate Qualifying Exam described below. Teaching experience is defined as service as a graduate student instructor in a course designated by the department. The total teaching requirement for new Ph.D. students is four quarters at 25 percent effort (ten hours per week). At least one quarter of teaching experience is required during the first year (prior to the departmental qualifying examination) and at least one quarter in the second year. Teaching experience can be fulfilled as a requirement for student support or taken as a course for academic credit (Bioengineering 501). Students must contact the Student Affairs Office to plan for completion of this requirement.

The **Senate Qualifying Examination** is the second examination required of bioengineering Ph.D. students. In preparation for this examination, students must have completed the Departmental Qualifying Examination and the departmental teaching experience requirement, obtained a faculty research adviser, and identified a topic for their dissertation research and made initial progress. At the time of application for advancement to candidacy, a doctoral committee responsible for the remainder of the student's graduate program is appointed by the Graduate Council. The committee conducts the Senate Qualifying Examination, during which students must demonstrate the ability to engage in thesis research. This involves the presentation and defense of a plan for the thesis research project. Upon successful completion of this examination, students are advanced to candidacy and are awarded the Candidate in Philosophy degree *(see "Graduate Studies" section in this catalog)*.

The **Dissertation Defense** is the final Ph.D. examination. Upon completion of the dissertation research project, the student writes a dissertation that must be successfully defended in a public presentation and oral examination conducted by the doctoral committee. A complete copy of the student's dissertation must be submitted to each member of the doctoral committee approximately four weeks before the defense. It is understood that this copy of the dissertation given to committee members will not be the final copy, and that the committee members may suggest changes in the text at the time of the defense. This examination must be conducted after at least three quarters of the date of advancement to doctoral candidacy. Acceptance of the dissertation by the Office of Graduate Studies and Research and the university librarian represents the final step in completion of all requirements for the Ph.D.

There is no formal foreign language requirement for doctoral candidates. Students are expected to master whatever language is needed for the pursuit of their own research.

Ph.D. Time Limit Policy

Pre-candidacy status is limited to four years. Doctoral students are eligible for university support for six years. The defense and submission of the doctoral dissertation must be within seven years.

Evaluations

In the spring of each year, the faculty evaluate each doctoral student's overall performance in course work, research, and prospects for financial support for future years. A written assessment is given to the student after the evaluation. If a student's work is found to be inadequate, the faculty may determine that the student cannot continue in the graduate program.

COURSES

Note: The department will endeavor to offer the courses as outlined below; however, unforeseen circumstances sometimes mandate a change of scheduled offerings. Students are strongly advised to check with the department's Student Affairs Office. This is of particular importance in planning schedules for graduation requirements. The following schedule is tentative for the academic year 2004–2005 only.

It should not be assumed that the same schedule will continue after this academic year. It is the student's responsibility to contact the Student Affairs Office to determine the specific quarter that courses will be offered.

Prerequisites are enforced when adding courses. Students who have satisfied prerequisites at another institution or by AP credit need to be pre-authorized to register in these courses. Please contact the Student Affairs Office before your scheduled registration time to be pre-authorized.

LOWER-DIVISION

1. Introduction to Bioengineering (1)
An introduction to the central topics of bioengineering in a seminar format. The principles of problem definition, team design, engineering inventiveness, information access, communication, ethics, and social responsibility will be emphasized. P/NP grading only. *Prerequisite: none.* (W).

87. Freshman Seminar (1)
The Freshman Seminar Program is designed to provide new students with the opportunity to explore an intellectual topic with a faculty member in a small seminar setting. Freshman seminars are offered in all campus departments and undergraduate colleges, and topics vary from quarter to quarter. Enrollment is limited to fifteen to twenty students, with preference given to entering freshmen. (F,W,S)

90. Undergraduate Seminar (1)
Selected topics of interest to the faculty will be used to introduce students to bioengineering science and design concepts. (Not open to upper-division bioengineering students.) (F,W,S)

97. Internship/Field Studies (1-4)
An enrichment program available to a limited number of lower-division undergraduate students, which provides work experience with industry, government offices, and hospitals. The internship is coordinated through UCSD's Academic Internship Program under the supervision of a faculty member and an industrial, government, or hospital employee. Prerequisites: lower-division standing, completion of thirty units of UCSD undergraduate study, a minimum UCSD GPA of 3.0, and a completed and approved "Special Studies" form, "UCSD Application for Enrollment Special Studies Courses 97, 98, 99." (F,W,S)

98. Directed Group Study (1-4)
Directed group study on a topic or in a field not included in the regular department curriculum. (P/NP

grades only.) Prerequisites: lower-division standing, completion of thirty units of undergraduate study at UCSD with a UCSD GPA of at least 3.0 and consent of a bioengineering faculty member; completed and approved Special Studies form.

99. Independent Study for Undergraduates (4)
Independent reading or research by arrangement with a bioengineering faculty member. (P/NP grades only.) Prerequisites: lower-division standing, completion of thirty units of undergraduate study at UCSD with a UCSD GPA of at least 3.0 and consent of a bioengineering faculty member; completed and approved Special Studies form.

UPPER-DIVISION

100. Introduction to Bioengineering Design (4)
A general introduction to bioengineering design, including examples of engineering analysis and design applied to representative topics in biomechanics, bioinstrumentation, biomaterials, biotechnology, and related areas. A review of technological needs, design methodology, testing procedures, statistical analysis, governmental regulation, evaluation of costs and benefits, quality of life, and ethical issues. *Prerequisites: BENG 1; grade of C– or better in Math. 21C or Math. 20C and Math. 21D or Math. 20D, and Physics 2C; majors only.* (S)

101. Foundations of Biomedical Imaging (4)
An introduction to the principles and applications of biomedical imaging, with emphasis on the acquisition, processing, display of imagery, and design of imaging systems. Filtering, convolution, and Fourier methods. Microscopy, radiography, computed tomography, magnetic resonance, ultrasound, and nuclear imaging. *Prerequisites: Grade of C- or better in BENG 100; majors only or consent of department.* (F)

103B. Bioengineering Mass Transfer (4)
Mass transfer in solids, liquids, and gases with application to biological systems. Free and facilitated diffusion. Convective mass transfer. Diffusion-reaction phenomena. Active transport. Biological mass transfer coefficients. Steady and unsteady state. Flux-force relationships. (Students may not receive credit for both CENG 101C and BENG 103B.) *Prerequisites: grade of C– or better in BENG 112A; majors only.* (S)

106B. Bioengineering Dynamics (4)
Kinematics and kinetics of particles and rigid bodies. Muscle and joint loads. Musculoskeletal dynamics, locomotion, and clinical applications. Bodies in contact: friction, momentum, and impulse; impact and injury. Work, power, and energy relationships; conservation laws of dynamics. Bioengineering design problems, problem formulation, and problem solutions. (Students may receive credit for one of the following: MAE 130B, SE 101B, or BENG 106B.) *Prerequisites: grade of C– or better in Math. 21D or Math 20D and MAE 130A/SE 101A; majors only.* (W)

110. Continuum Mechanics (4)
An introduction to continuum mechanics of both living and non living bodies. The laws of motion and free-body diagrams. Stresses. Deformation. Compatibility conditions. Constitutive equations. Properties of common fluids and solids. Derivation of field equations and boundary conditions. Applications to bioengineering design. *Prerequisites: grades of C– or better in Physics 2A, 2B, 2C; majors only.* (F)

112A. Biomechanics (4)
Introduction to physiological systems, with emphasis on structure and function of major tissues and organs. Application of mechanics to understand the behavior of these tissues and organs at gross and microscopic levels. Bioelastic solids. Rigid body biomechanics. Biofluids. Bioengineering and medical design. *Prerequisites: grade of C– or better in BENG 110; majors only.* (W)

112B. Biomechanics (4)
Biomechanics of living tissues with emphasis on continuum analysis of problems in biofluid and cell mechanics. Engineering design and problem solving in the biomechanics of mammalian tissues, especially those of the cardiovascular system. *Prerequisites: grade of C– or better in BENG 112A; majors only.* (S)

122A. Biosystems and Control (4)
Systems and control theory applied to bioengineering. Modeling, linearization, transfer functions, Laplace transforms, closed-loop systems, design and simulation of controllers. Dynamic behavior and controls of first and second order processes. PID controllers. Stability. Bode design. Features of biological controls systems. A simulation term project using MATLAB and an oral presentation are required. *Prerequisites: grade of C– or better in MAE 140; majors only or consent of department.* (W)

122B. Biomedical Electronics (4)
Analog and digital circuits in bioinstrumentation. Biomedical signals in continuous and discrete systems. Sampling and digital signal processing. MRI. CT. Ultrasound. Bioelectromagnetics. Electrokinetics. *Prerequisites: grade of C– or better in BENG 122A and BENG 186B; majors only or permission of instructor.* (S)

123. Systems Biology and Bioengineering (4)
Systems biology and bioengineering is comprised of (1) enumeration of biological components participating in a biological process, (2) reconstruction of interactions to form a network, (3) mathematical representation for analysis, interpretation, and prediction, (4) model validation and use in prospective design. Prerequisites: grade of C– or better in BIBC 100; majors only. (W)

125. Modeling and Computation in Bioengineering (4)
Computational modeling of molecular bioengineering phenomena: excitable cells, regulatory networks, and transport. Application of ordinary, stochastic, and partial differential equations. Introduction to data analysis techniques: power spectra, wavelets, and nonlinear time series analysis. Prerequisites: grade of C– or better in BENG 122A or BENG 123; majors only or consent of instructor. (S)

130. Molecular Physical Chemistry (4)
An introduction to physical principles that govern biological matter and processes. Thermodynamic principles and their molecular origin, structural basis of life and physical and conceptual models to illustrate life phenomena. (Students may receive credit for one of the following: Chem. 126, Chem. 127, Chem. 131, or BENG 130.) *Prerequisites: grade of C– or better in Chem 6B, Math. 20A, 20B, Physics 2A, 2B, 2C. (Physics 2C may be taken concurrently.); majors only.* (W)

140A. Bioengineering Physiology (4)
Introductory mammalian physiology for bioengineering students, with emphasis on control mechanisms and engineering principles. Basic cell functions; biological control systems; muscle; neural; endocrine, and circulatory systems. Not intended for premedical bioengineering students. (Students may not receive credit for both BIPN 100 and BENG 140A.) *Prerequisites: grade of C– or better in Chem. 6A, 6B, Physics 2A, 2B, 2C, BILD 1; majors only.* (W).

140B. Bioengineering Physiology (4)
Introductory mammalian physiology for bioengineering students, with emphasis on control mechanisms and engineering principles. Digestive, respiratory, renal, and reproductive systems; regulation of metabolism, and defense mechanisms. (Students may not receive credit for both BIPN 102 and BENG 140B.) *Prerequisite: grade of C– or better in BENG 140A; majors only.* (S).

161A. Bioreactor Engineering (4)
Introduction to the principles and practices of biochemical engineering. Important engineering, biochemical and physiological considerations in the design of bioreactor processes: enzyme kinetics, mass transfer limitations, microbial growth, and product formation kinetics. Fermentation reactor selection, design, scale-up, and control. *Prerequisites: grade of C– or better in Chem 114B or BIBC 102 (may be taken concurrently), BENG 122A and admission to the major.* (F)

161B. Biochemical Engineering (4)
Commercial production of biochemical commodity products. Application of genetic control systems and mutant populations. Recombinant DNA and eucaryotic proteins in E. coli and other host organisms. Product recovery operations, including the design of bioseparation processes of filtration, adsorption, chromatography, and crystallization. Bioprocess economics. Human recombinant erythropoietin as an example, from genomic cloning to CHO cell expression, to bioreactor manufacturing and purification of medical products for clinical application. *Prerequisite: grade of C– or better in BENG 161A; majors only.* (W)

161C. Metabolic Engineering (4)
Engineering systems analysis of metabolic and regulatory processes. Use of high-throughput data for network reconstruction. Formulation of the stoichiometric matrix and its uses to determine steady state flux distributions. Kinetics of individual enzymatic reactions. Computer simulations of metabolic networks, systemic sensitivity coefficients, bifurcations to study dynamic network functions. Temporal decomposition of metabolic processes into multiple time scales and the physiologic roles of metabolic events in each scale. *Prerequisite: grade of C– or better in BENG 161B; majors only.* (S)

162. Biotechnology Laboratory (4)
Laboratory practices and design principles for biotechnology. Culture of microorganisms and mammalian cells, recombinant DNA bioreactor design and operation. Design and implementation of biosensors. A team design-based term project and oral presentation required. *Prerequisites: admission to the major; MAE 170, BENG 166A, BENG 161B (must be taken concurrently).* (W)

164. Bioengineering of Biochemical Techniques (1)
Quantitative bioengineering analysis and design of biochemical processes and experiments on biological molecules. Centrifugation, electrophoresis, chromatography. Radioactive tracers. Enzyme activity. Immunoassay. *Prerequisites: admission to the major; grade of C– or better in BENG 161B and BIBC 103 (may be taken concurrently).* (S)

166A. Cell and Tissue Engineering (4)
Engineering analysis of physico-chemical rate processes that affect, limit, and govern the function of

cells and tissues. Cell migration, mitosis, apoptosis, and differentiation. Dynamic and structural interactions between mesenchyme and parenchyme. The role of the tissue microenvironment including cell-cell interactions, extracellular matrix, and growth factor communication. The design of functional tissue substitutes including cell and material sourcing, scale-up and manufacturability, efficacy and safety, regulatory, and ethical topics. Clinical Applications. *Prerequisite: admission to the major or consent of department; senior standing and (BENG 103B OR BENG 112B).* (F)

168. Biomolecular Engineering (4)
Basic molecular biology; recombinant DNA technologies; design and manufacture of recombinant proteins and genetically engineered cells; architecture and mechanism of molecular nano-machineries that perform gene regulation, energy conversion, enzymatic catalysis, and active transport. Prerequisites: BILD 1 and BENG 100; majors only or consent of instructor. (S)

172. Bioengineering Laboratory (4)
A laboratory course which demonstrates basic concepts of bioengineering design through experimental procedures involving humans and animals. Statistical principles of experimental design. Study of possible errors. Experiments include nerve action, electrocardiography, mechanics of muscle, membranes, and noninvasive diagnostics in humans. *Prerequisites: grade of C– or better in MAE 170 and junior or senior standing in the major.* (S)

181/BIMM 181/CSE 181. Molecular Sequence Analysis (4)
(Cross-listed as BIMM 181 and CSE 181.) This course covers the analysis of nucleic acid and protein sequences, with an emphasis on the application of algorithms to biological problems. Topics include sequence alignments, database searching, comparative genomics, and phylogenetic and clustering analyses. Pairwise alignment, multiple alignment, DNA sequencing, scoring functions, fast database search, comparative genomics, clustering, phylogenetic trees, gene finding/DNA statistics. *Prerequisites: CSE 100 or Math. 176, CSE 101 or Math. 188, BIMM 100 or Chem. 114C; Bioinformatics majors only.* (S)

182/BIMM 182/CSE 182/CHEM182. Biological Databases (4)
(Cross-listed as BIMM 182, CSE 182, and Chem. 182.) This course provides an introduction to the features of biological data, how those data are organized efficiently in databases, and how existing data resources can be utilized to solve a variety of biological problems. Object oriented databases, data modeling and description. Survey of current biological database with respect to above, implementation of database focused on a biological topic. *Prerequisite: CSE 100 or Math. 176; Bioinformatics majors only.* (F)

183. Applied Genomic Technologies (4)
Principles and technologies for using genomic information for biomedical applications. Technologies will be introduced progressively, from DNA to RNA to protein to whole cell systems. The integration of biology, chemistry, engineering, and computation will be stressed. Topics include: Technology for the Genome, DNA Chips, RNA Technologies, Proteomic Technologies, Physiomic and Phenomic Technologies, Analysis of Cell Function. *Prerequisite: grade of C– or better in BIMM 100 or Chem 114C; BICD 110; Bioinformatics majors only.* (F)

184/BIMM 184/CSE 184. Computational Molecular Biology (4)
(Cross-listed as BIMM 184 and CSE 184.) This advanced course covers the application of machine learning and modeling techniques to biological systems. Topics include gene structure, recognition of DNA and protein sequence patterns, classification, and protein structure prediction. Pattern discovery, hidden Markov models/support vector machines/neural network/profiles, protein structure prediction, functional characterization of proteins, functional genomics/proteomics, metabolic pathways/gene networks. *Prerequisites: BENG 181 or BIMM 181 or CSE 181; BENG 182 or BIMM 182 or CSE 182 or CHEM 182; Bioinformatics majors only.* (W)

186A. Principles of Biomaterials Design (4)
Fundamentals of materials science as applied to bioengineering design. Natural and synthetic polymeric materials. Materials characterization and design. Wound repair, blood clotting, foreign body response, transplantation biology, biocompatibility of materials, tissue engineering. Artificial organs and medical devices. Government regulations. Patenting. Economic impact. Ethical issues. A term project and oral presentation are required. *Prerequisite: grade of C– or better in BENG 112B or senior standing in Bioengineering: Biotechnology major; majors only or consent of department.* (F)

186B. Principles of Bioinstrumentation Design (4)
Biophysical phenomena, transducers, and electronics as related to the design of biomedical instrumentation. Potentiometric and amperometric signals and amplifiers. Biopotentials, membrane potentials, chemical sensors. Electrical safety. Mechanical transducers for displacement, force, and pressure. Temperature sensors. Flow sensors. Light-based instrumentation. *Prerequisites: grade of C– or better in MAE 140 and MAE 170.* (W)

186C. Bioengineering Design (4)
Development of an original bioengineering design described in a formal engineering report, leading to a major and complete design experience. Emphasis on engineering analysis and application of methodology from various branches of applied mechanics. Includes analysis of economic, environmental, manufacturability, ethical, health and safety, social, political issues, and application of governmental regulations. A term project and oral presentation are required. *Prerequisites: grades of C– or better in BENG 103B, BENG 106B, BENG 112B, and BENG 186B; CENG 101A, MAE 107 and MAE 130A; majors only.* (S)

191. Senior Seminar I: Professional Issues in Bioengineering (2)
Role of bioengineers in industry. Professional identity. Structure of bioengineering industries and product development process. Job market analysis. Current employment opportunities. Recruiting process and interview. Analysis of the employer. Marketing vs. engineering. Management by objective. Role of higher degrees. *Prerequisite: consent of instructor.* (W)

195. Teaching (2-4)
Teaching and tutorial assistance in a bioengineering course under supervision of instructor. Not more than four units may be used to satisfy graduation requirements. (P/NP grades only.) *Prerequisites: B average in the major and departmental approval.* (F,W,S)

196. Bioengineering Industrial Internship (1-4)
Under the joint supervision of a faculty adviser and industry mentor, the student will work at a bioengineering industrial site to gain practical bioengineering experience. No more than twelve units may be used to satisfy graduation unit requirements. (P/NP grades only) *Prerequisites: consent of department and completion of all lower-division course requirements, including general-science requirements. Some laboratory experience is needed. Completion of ninety units with a 2.5 GPA and consent of a bioengineering faculty coordinator.* (F,W,S,Su)

197. Engineering Internship (1-4)
An enrichment program, available to a limited number of undergraduate students, which provides work experience with industry, government offices, hospitals, and their practices. Subject to the availability of positions, students will work in a local industry or hospital (on a salaried or unsalaried basis) under the supervision of a faculty member and industrial supervisor. Coordination of the Engineering Internship is conducted through UCSD's Academic Internship Program. Time and effort to be arranged. Final report required. *Prerequisites: completion of ninety units with a 2.5 GPA and consent of a bioengineering faculty coordinator.* (F,W,S,Su)

198. Directed Group Study (1-4)
Directed group study, on a topic or in a field not included in the regular department curriculum, by arrangement with a bioengineering faculty member. (P/NP grades only.) *Prerequisites: consent of instructor; upper-division standing, completion of ninety units of UCSD undergraduate study, a minimum UCSD GPA of 2.5, and a completed and approved "Special Studies" form, "Application for UCSD Special Studies Course Enrollment."* (F,W,S)

199. Independent Study for Undergraduates (4)
Independent reading or research by arrangement with a bioengineering faculty member. (P/NP grades only.) *Prerequisites: consent of instructor; upper-division standing, completion of ninety units of UCSD undergraduate study, a minimum UCSD GPA of 2.5, and a completed and approved "Special Studies" form, "Application for UCSD Special Studies Course Enrollment."* (F,W,S,Su)

GRADUATE

202/CSE 257A. Bioinformatics II: Sequence and Structure Analysis—Methods and Applications (4)
Introduction to methods for sequence analysis. Applications to genome and proteome sequences. Protein Structure, sequence-structure analysis. *Prerequisite: Pharm. 201 or consent of instructor.* (W)

203. Bioinformatics III: Genomes Analysis (4)
Annotating genomes, characterizing functional genes, profiling, reconstructing pathways. *Prerequisites: Pharm. 201, BENG 202/CSE 257A or consent of instructor.* (S)

207. Topics in Bioengineering (4)
Course given at the discretion of the faculty on current topics of interest in bioengineering. (F,W,S)

208. Topics in Bioengineering with Lab (2 or 4)
A course to be given at the discretion of the faculty on topics of current interest in engineering science. This course is intended to be a lecture and lab companion topics course. *Prerequisite: consent of instructor.* (S)

BENG 209. Continuum Mechanics Applied to Medicine/Biology
Introduction to the basic definitions of Continuum Mechanics and their mathematical formulation at the

graduate level with applications to problems in medicine and biology. This course is intended for students with little or no background in mechanics; it is an introduction to the Biomechanics courses BENG 250 A-B in the Department of Bioengineering and to Solid and Fluid Mechanics courses MAE 210A and MAE 231A in the Department of Mechanical and Aerospace Engineering. This course should NOT be taken concurrently with MAE 210A or MAE 231A. *Prerequisite: consent of instructor.* (F)

BENG 211. Systems Biology and Bioengineering I: Biological Components
Components of biological systems, their biochemical properties and function. The technology used for obtaining component lists. Relationship within and integration of component lists. Structured vocabularies and component ontologies. Algorithms for comparative approaches in deciphering and mining component lists. *Prerequisite: BENG 230A or BIMM 100 or consent of instructor.* (F)

BENG 212. Systems Biology and Bioengineering II: Network Reconstruction
This course will cover the process of reconstructing complex biological reaction networks. Reconstruction of metabolic networks, regulatory networks and signaling networks. Bottom-up and top-down approaches. The use of collections of historical data. The principles underlying high-throughput experimental technologies and examples given on how this data is used for network reconstruction, consistency checking, and validation. *Prerequisite: BENG 211 or consent of instructor.* (W)

BENG 213. Systems Biology and Bioengineering III: Building and Simulating Large-scale In Silico Models
Mathematical models of reconstructed reaction networks and simulation of their emergent properties. Classical kinetic theory, stochastic simulation methods and constraints-based models. Methods that are scalable and integrate multiple cellular processes will be emphasized. Existing genome-scale models will be described and computations performed. Emphasis will be on studying the genotype-phenotype relationship in an in silico model driven fashion. Comparisons with phenotypic data will be emphasized. *Prerequisite: BENG 212 or consent of instructor.* (S)

220. Project Design and Development (4)
The design of a research/development project for an industrial setting. Project objectives and organization, funding sources, review of previous developments in the area, proposal writing and review, project management, intellectual property, regulatory issues. The term project will involve preparing a small business proposal for development of a medical device. *Prerequisite: open to students with graduate standing in bioengineering.* (W)

225. BioBusiness: Starting, Growing, and Harvesting a Biotech Company
Biotech is a special breed of business, especially in the start-up and early phases. Whether you are considering joining a biotech start-up or want to be successful in a life science organization, it pays to understand this unique business model. In this course, you will study and analyze (1) start-up proposals (2) the genesis of the biotech industry (3) biotech categories and growth strategies (4) the process of spinning out viable product concepts from academia (5) financing techniques (6) business development (7) acquisition/IPO valuation methods (8) potentially disruptive technologies. The format is highly interactive and learning is enhanced by means of exercises, team presentations, and case studies. Prerequisites: for bioengineering MEng degree students or consent of instructor. (F,W)

230A. Biochemistry (4)
A graduate course in biochemistry especially tailored to the requirements and background of bioengineering graduate students. It will cover the important macro- and small molecules in cells that are the major constituents, or that function as signaling molecules or molecular machineries. The structures, pathways, interactions, methodologies, and molecular designs using recombinant DNA technology will be covered. *Prerequisites: BIPN 100 and 102, or consent of instructor.* (F)

230B. Cell and Molecular Biology (4)
A general survey of structure-function relationships at the molecular and cellular levels. Emphasis on basic genetic mechanisms; control of gene expression; membrane structure, transport and traffic; cell signaling; cell adhesion; mechanics of cell division; and cytoskeleton. *Prerequisites: BIPN 100 and 102, and BENG 230A, or consent of instructor.* (W)

230C. Cardiovascular Physiology (4)
Physical concepts of behavior of heart, large blood vessels, vascular beds in major organs and the microcirculation. Physical and physiological principles of blood flow, blood pressure, cardiac work, electrophysiology of the heart. Special vascular beds, including their biological and hemodynamic importance. Integration through nervous and humoral controls. *Prerequisites: BIPN 100 ,102 , and BENG 230B, or consent of instructor.* (S)

230D. Respiratory and Renal Physiology (4)
Mechanics of breathing. Gas diffusion. Pulmonary blood flow. Stress distribution. Gas transport by blood. Kinetics of oxygen and carbon dioxide exchange. VA/Q relations. Control of ventilation. Glomerular and proximal tubule functions. Water metabolism. Control of sodium and potassium in the kidney. *Prerequisites: BIPN 100 ,102 , and BENG 230C, or consent of instructor.* (F,W,S)

238. Molecular Biology of the Cardiovascular System (4)
This course will give an overview of heart and vascular development and disease from a molecular biological perspective. Current approaches for generating mouse models of cardiovascular disease and recently developed technologies for physiological assessment in small animal models will be presented. (S)

241A. Foundations of Tissue Engineering Science (4)
Molecular and cell biological basis of tissue engineering science. Paracrine control of tissue growth and differentiation. Biomechanics and the molecular basis of cell-cell and cell-matrix interactions. Cell motility, mechanics of tissue growth and assembly, tissue repair. Mass transfer in tissues. Microcirculation of blood and lymph. *Prerequisite: BENG 230A or consent of instructor.* (S)

241B. Methods in Tissue Engineering Science (4)
Isolation of cells, cell and tissue culture systems. Fluorescence and confocal microscopy. Intracellular imaging. Mechanical testing of tissues. Micromechanical measurement and analysis of cell deformability and cell interaction. Methods in microcirculation and angiogenesis. *Prerequisite: BENG 241A or consent of instructor.* (F)

241C. Applications of Tissue Engineering Science (4)
A lecture/seminar series featuring speakers from academia and industry emphasizing principles of tissue engineering science as applied to clinical medicine and industrial production. Topics include skin replacement, guide tubes for nerve regeneration, blood substitutes, pancreatic islet replacement, and drug delivery devices, among others. Ethics of tissue replacement. *Prerequisite: BENG 241B or consent of instructor.* (W)

BENG 247A. Advanced BioPhotonics
Basic physics and chemistry for the interaction of photons with matter, including both biological and synthetic materials; use of photonic radiation pressure for manipulation of objects and materials; advanced optoelectronic detection systems, devices and methods, including time resolved fluorescent and chemiluminescent methods, fluorescent energy transfer (FRET) techniques, quantum dots, and near-field optical techniques; underlying mechanisms of the light sensitive biological systems, including chloroplasts for photosynthetic energy conversion and the basis of vision processes. *Prerequisite: graduate standing.* (F)

BENG 247B. BioElectronics
Topics to be covered will include photolithographic techniques for high-density DNA microarray production, incorporation of CMOS control into electronic DNA microarrays, direct electronic detection technology used in microarrays and biosensor devices, and focus on problems related to making highly integrated devices (lab-on-a-chip, *in vivo* biosensors, etc.) form heterogeneous materials and components. *Prerequisite: graduate standing.* (W)

BENG 247C. Bionanotechnology
Topics include: nanosensors and nanodevices for both clinical diagnostics and biowarfare (bioterror) agent aetection; nanostructures for drug delivery; nanoarrays and nanodevices; use of nanoanalytical devices and systems; methods and techniques for modification or functionalization of nanoparticles and nanostructures with biological molecules; nanostructural aspects of fuel cells and biofuel cells; potential use of DNA and other biomolecules for computing and ultra-high-density data storage. *Prerequisite: graduate standing.* (S)

250A. Biomechanics (4)
An introduction to biomechanics and transport phenomena in biological systems at the graduate level. Biorheology, biosolid mechanics, muscle mechanics, mass transfer, momentum transfer, energy transfer. *Prerequisites: CENG 103B and BENG 112B, or consent of instructor.* (W)

250B. Advanced Biomechanics (4)
Modern development of biomechanics at an advanced mathematical level. Selected topics in the dynamics of heart, pulsatile, blood flow, microcirculation, and muscle mechanics. *Prerequisite: BENG 253 or consent of instructor.* (S)

253. Biomedical Transport Phenomena (4)
Nonequilibrium thermodynamic analysis of transport phenomena. The osmotic effect. Diffusion and exchange in biological systems. *Prerequisite: consent of instructor.* (W)

264. Advanced Biomedical Transport Phenomena (4)
Applications of heat, mass, and momentum transfer in biomedical systems. Extension of the principles encountered in BENG 252B-C to practical biomedical systems. *Prerequisite: BENG 252B-C.*

267. Microcirculation in Health and Disease (4)
Structural and functional aspects of transport and blood-tissue exchange in key organs during circulatory shock, bacterial toxemia, hypertension. Physical and ultrastructural techniques used to analyze small-vessel dynamics. *Prerequisite: consent of instructor.*

275. Computational Biomechanics (4)
Finite element methods for anatomical modeling and boundary value problems in the biomechanics of tissues and biomedical devices. Nonlinear biodynamics, heat flow, cardiac impulse propagation, anatomic modeling, and biomechanics. *Prerequisite: consent of instructor.* (F)

BENG 280A. Principles of Biomedical Imaging
Fundamentals of Fourier transform and linear systems theory including convolution, sampling, noise, filtering, image reconstruction and visualization with an emphasis on applications to biomedical imaging. Examples from optical imaging, CT, MR, ultrasound, nuclear, PET, and radiography. *Prerequisite: consent of instructor.* (F)

BENG 280B. Comparative Biomedical Imaging
Application of biomedical imaging to the measurement of structure, function, and dynamics of organ systems from the microscopic to the organ level. Emphasis on detailed evaluation and comparison of specific imaging modalities. *Prerequisite: consent of instructor.* (W,S)

281. Seminar in Bioengineering (1)
Weekly seminars by faculty, visitors, postdoctoral research fellows, and graduate students concerning research topics in bioengineering and related subjects. May be repeated for credit. This course does not apply toward the M.S. graduation requirements. (S/U grades only.) (F,W,S)

290. Bioengineering Special Graduate Seminar (1-2)
Seminars by faculty, visitors, post-doctoral research fellows, and/or graduate students in selected topic(s) in bioengineering and/or related subjects. This course does not apply toward M.S. graduation requirements.

295. Bioengineering Design Project and Industrial Training (4)
Independent work by graduate students focused on design, applied research, and professional experience. *Prerequisite: consent of department and bioengineering faculty adviser.* (F,W,S)

296. Independent Study (4)
Prerequisite: consent of instructor.

298. Directed Group Study (1-4)
Directed group study on a topic or in a field not included in regular department curriculum, by special arrangement with a faculty member. *Prerequisite: consent of instructor.* (S/U grade only.)

299. Graduate Research (1-12)
(S/U grades only.)

501. Teaching Experience (2)
Teaching experience in an appropriate bioengineering undergraduate course under direction of the faculty member in charge of the course. Lecturing one hour per week in either a problem-solving section or regular lecture. (S/U grade only.) *Prerequisites: consent of instructor and departmental approval.* (F,W,S)

Chemical Engineering Program (CENG)

Student Affairs: 182 Engineering Building II, Warren College

AFFILIATED FACULTY

Professors

P. C. Chau, Ph.D., *MAE, Co-Director*
J.E. Crowell, Ph.D., *Chemistry*
C. H. Gibson, Ph.D., *MAE*
D. A. Gough, Ph.D., *Bioengineering*
M. Krstic, Ph.D., *MAE*
A. C. Kummel, Ph.D., *Chemistry*
J. Lasheras, Ph.D., *MAE*
P. F. Linden, Ph.D., *MAE*
J. McKittrick, Ph.D., *MAE*
D. R. Miller, Ph.D., *MAE*
B. O. Palsson, Ph.D., *Bioengineering*
C. Pozrikidis, Ph.D., *MAE*
K. Seshadri, Ph.D., *MAE*
J. B. Talbot, Ph.D., *MAE, Program Director*
F. A. Williams, Ph.D., *MAE*

Professor Emeritus

S. Middleman, Ph.D., *MAE*

Associate Professors

C.P. Caulfield, Ph.D., *MAE*
R. K. Herz, Ph.D., *MAE*

Assistant Professors

R. deCallafon, Ph.D., *MAE*
G. A. Huber, Ph.D., *Bioengineering*

Program Mission and Objectives

The Chemical Engineering Program has affiliated faculty from the Department of Mechanical and Aerospace Engineering, Department of Chemistry and Biochemistry, and the Department of Bioengineering. The program is administered by the Department of Mechanical and Aerospace Engineering. The curricula at both the undergraduate and graduate levels are designed to support and foster chemical engineering as a profession that interfaces engineering and all aspects of basic sciences (physics, chemistry, and biology).

The mission of the Chemical Engineering Program is to provide the next generation of chemical engineers with an excellent and innovative chemical engineering education. The primary goals are:

- To provide chemical engineering students with a strong technical education and communication skills that will enable them to have successful careers in a wide range of industrial and professional environments.
- To prepare chemical engineering students for rapidly changing technological environments with the core knowledge central to multidisciplinary development and personal improvement throughout their professional careers.
- To instill in chemical engineering students a strong sense of humanistic values and professionalism such that they can conduct ethically and knowledgeably regarding technological impact in societal issues.

The curriculum is designed to prepare chemical engineering graduates for further education and personal development through their entire professional career. We strive to accomplish these goals by providing a rigorous and demanding curriculum that incorporates lectures, discussions, laboratory and project development experiences in basic sciences, mathematics, engineering sciences, and design as well as the humanities and social sciences. The main objectives are:

1. To enable students to understand and apply scientific principles and engineering and computational tools to analyze and solve problems of importance to society.
2. To enable students to apply appropriate experimental and statistical techniques in engineering analysis and applications.
3. To enable students to incorporate engineering economics and information from multiple disciplines in the analysis, synthesis, and design of engineering systems under realistic settings.
4. To enable students to acquire effective technical writing and oral communication skills necessary for successful participation on teams and in leadership positions.
5. To enable students to acquire the basic knowledge of chemical and process safety.
6. To instill in our students an understanding of their professional and ethical responsibilities.

Unless otherwise stated, the requirements and policies follow those of the Department

of Mechanical and Aerospace Engineering. Only features unique to Chemical Engineering are provided in this section.

The Undergraduate Program

The B.S. program in Chemical Engineering is accredited by the Engineering Accreditation Commission of the Accreditation Board of Engineering and Technology (ABET/EAC). The curriculum is tailored to provide breadth and flexibility by taking advantage of the strength of basic sciences and other engineering disciplines at UCSD. The intention is to graduate chemical engineers who are multidisciplinary and can work in a broad spectrum of industries rather than solely traditional chemical and petrochemical industries.

Areas of specialization are available whereby a graduate can be in a position for a career in environmental technology, microelectronic device fabrication, materials and polymer processing, pharmaceutical and biotechnology, biomedical engineering, energy and thermal systems, control and system engineering, and so forth.

For students who aspire to pursue a graduate degree and a career in research and development, the units in an area of specialization can be allocated to more fundamental science and engineering courses. These students are also encouraged to perform independent projects in one of the faculty research laboratories or groups.

Whether the career goal is industry, or graduate or professional school, the curriculum has a strong emphasis on developing problem-solving skills and the ability to think and learn independently. The capstone courses in this respect are the two senior design courses and the two very unique senior process laboratory courses where the environment is not unlike product development in either an industrial or academic setting. In each process development lab, students work in groups of three, on one project where they carry through the entire stages of project planning, experimental design and setup, execution, analysis, modification and improvement, and final project evaluation.

Major Requirements

For policies in general education requirements, professional licensing, academic advising, and application for admission to the major, please refer to the section under Mechanical and Aerospace Engineering.

To receive a B.S. in Chemical Engineering, students must complete 194 units for graduation, which includes 44 units of general education (HSS) requirements of their Colleges and the ABET requirements in the arts, humanities, and social sciences. The balance consists of basic sciences (53 units), chemistry core (24 units), chemical engineering core (32 units), process laboratory and design (16 units), general engineering (12 units), and an area of specialization (12 units). Beyond the 53 units of basic sciences, the science and engineering courses total to 96 units. A one-unit introductory seminar (CENG1) is required of all incoming freshmen. The specific breakdown is as follows:

Basic sciences (53 units): This lower-division requirement includes 24 units of mathematics (Math. 20A-F), 14 units of physics (Phys. 2A-C, 2CL), and 15 units of chemistry (Chem. 6A-C, 6CL).

Chemistry core (24 units): This requirement must include two physical and one organic chemistry courses (Chem. 131, 132, 140A). Three additional advanced chemistry courses must be chosen among biochemistry, physical, organic, and inorganic chemistries. Two courses must be selected among Chem. 133, 135, 140B or 141B, 114A-B, 120A-B, and the third must be a laboratory course selected among Chem. 105, 106, and 143A.

Chemical engineering core (32 units): This requirement covers chemical process modeling, solution thermodynamics, transport phenomena, chemical reaction engineering, process control, and unit operations (CENG 100, 101A-C, 102, 113, 120, 122).

Process laboratory and design (16 units): This requirement is crucial to fulfill the ABET design content (CENG 124A-B, 176A-B).

General engineering (12 units): This requirement covers basics in computer programming, probability and statistics, and instrumentation. The computer programming requirement can be satisfied with a course in either Fortran (MAE 10), C (MAE 9), or Java (CSE 8B or 11). If you have no programming experience, you need CSE 8A before 8B, but no credit is given for 8A alone. Probability and statistics can be satisfied with ECE 109 or a course with equivalent content. Instrumentation is satisfied with MAE 170.

Electives in an area of specialization (12 units): Electives are intended to broaden and enhance professional goals. They may be chosen to achieve either breadth or depth in one's education. These electives must be upper-division courses in either science or engineering. Suggestions are listed below. To ensure that your selections have proper engineering content, you must have faculty approval before you take these electives.

Biotechnology/Biochemical Engineering: Both Chem. 114A-B (or BIBC 100,102) must be taken as part of the advanced chemistry requirement. These two classes are prerequisites to the following courses: BIMM 100, BIMM 120, BIBC 110, Chem. 115, BE 160A-B-C.

Electronic Materials: Chem. 133 must be taken as part of the advanced chemistry requirement. This course is a prerequisite to the following courses: ECE 103, 134, 135A, 136, 136L.

Engineering Mechanics : MAE 130A-B, 131A, 160.

Engineering Science : MAE 105, 107, 140; Chem. 135, 136; Phys. 152 (requires Chem. 133).

Environmental Engineering: Chem. 149A-B, 173; MAE 120, 121, 122, 124, 125A-B.

Materials Science: Chem. 133 must be taken as part of the advanced chemistry requirement. This course is a prerequisite to the following courses: Chem. 107; Phys. 152; ECE 137; MS 201A-B-C, 205A, 227.

Process Control: ECE 101, 171A-B or MAE 140, 143A-B.

Thermal Engineering and Systems: MAE 118A-B-C, 110B, 113.

Independent Research: CENG 199 as equivalent to a senior thesis can be approved as equivalent to two elective courses (8 units). Consult department Student Affairs Office for details.

CHEMICAL ENGINEERING (ABET ACCREDITED PROGRAM)

FALL	WINTER	SPRING
FRESHMAN YEAR		
Math. 20A	Math. 20B	Math. 20C
Chem. 6A	Phys. 2A	Phys. 2B
MAE 9[1]	Chem. 6B	Chem. 6C/6CL
HSS2	CENG 1	HSS
	HSS	

SOPHOMORE YEAR		
Math. 20D	Math. 20F	Math. 20E
Phys. 2C/2CL	Chem. 132	Chem. 140A[3] or Chem 141A
Chem. 131	CENG 100	CENG 102
HSS	HSS	HSS
JUNIOR YEAR		
CENG 101A	CENG 101B	CENG 101C
Adv. Chem.[5]	CENG 113	Adv. Chem.
MAE 170	Adv. Chem.	ECE 109
HSS	HSS	HSS
SENIOR YEAR		
CENG 120[4]	CENG 124A	CENG 124B
CENG 122	CENG 176A	CENG 176B
AS[6]	AS	AS
HSS	HSS[7]	HSS

[1] MAE 9 can be replaced by MAE 10, CSE 8B or 11.

[2] Humanities and social sciences (HSS).

[3] Chem. 141A is offered only in the fall quarter. Chem133, 105, or 106 may fit in the spring quarter schedule.

[4] If a student chooses process control as the area of specialization, CENG 120 can be replaced by a relevant course within the approved set of courses for specialization in process control.

[5] Two advanced chemistry electives must be selected among Chem. 133, 135, 140B or 141B, 114A-B, and 120 A-B, and the third laboratory elective must be selected among Chem. 105, 106, and 143A. Students who choose Chem 105 must take Chem 6CL.

[6] The electives in an area of specialization (AS) must be upper-division or graduate courses in engineering, natural sciences or mathematics based on the pre-approved sequences. Otherwise, the selections must receive prior approval of the department to meet ABET standards.

[7] If students do not require these additional HSS courses to meet their College requirements, they may substitute an unrestricted elective in order to meet the minimum 194 unit graduation requirement. The twelfth HSS course is intended only for students who have additional College requirements to fulfill. To meet ABET requirements, students must have a total of twenty-four units in the arts, humanities, and social sciences, not including subjects such as accounting, industrial management, finance or personnel administration.

Transfer Students

The Chemical Engineering curriculum is designed to integrate four years of college educational experience. It is not easy for transfer students to complete the major requirements in only two additional years beyond their junior college work. However, if transfer students seek a College for which they already satisfy the general education requirements, have taken the lower-division science and mathematics, and have completed the organic chemistry requirement, then the rigorous first-year schedule below will permit them to graduate in two years. Other students should consult their adviser for a transition program compatible with their junior college preparation.

Effective **fall 2004**, it is **strongly recommended** that transfer students complete the following preparation for engineering majors*:

- Calculus I—for Science and Engineering (Math. 20A)
- Calculus II—for Science and Engineering (Math. 20B)
- Calculus and Analytic Geometry (Math. 20C)
- Differential Equations (Math. 20D)
- Linear Algebra (Math. 20F)
- Complete calculus-based physics series with lab experience (Physics 2A-B-C)
- Chemistry 6A (except Computer Science and Computer Engineering majors)
- Highest level of introductory computer programming language course offerings at the community college**

*Effective **fall 2006**, these courses will be **required** preparation for all engineering transfer students.

**Refer to the *UCSD General Catalog* to select major prerequisite requirement for computer language courses.

FALL	WINTER	SPRING
JUNIOR YEAR		
Chem. 131	Chem. 132	Adv. Chem.
CENG 101A	CENG 100	CENG 102
MAE 170	CENG 101B	CENG 101C
		ECE 109[1]

[1] Transfer students can petition with an equivalent course in probability and statistics if it is available at a junior college.

Integrated BS/MS Requirements

An integrated co-terminal program leading to a bachelor of science and a master of science degree in chemical engineering is offered to a student with junior standing who has an upper-division GPA of 3.5 or better and a 3.0 overall UCSD GPA. Details of the program are available from the MAE Graduate Student Affairs Office.

Program Accreditation

The B.S. program in chemical engineering is accredited by the Accreditation Board of Engineering and Technology (ABET/EAC).

Graduate Program

The Chemical Engineering Program offers graduate instruction leading to the **M.S. and Ph.D. degrees in engineering sciences** with a designated specialization in chemical engineering.

Admission is in accordance with the general requirements of the graduate division, which requires at least a B.S. in some branch of engineering, sciences, or mathematics; an overall GPA of 3.0; and three letters of recommendation from individuals who can attest to the academic or professional competence and to the depth of their interest in pursuing graduate study.

In addition, all applicants are required to submit GRE General Test Scores. A minimum score of 550 on the Test of English as a Foreign Language (TOEFL) is required of all international applicants whose native language is not English. Students who score below 600 on the TOEFL are strongly encouraged to enroll in an English as a second language program before beginning graduate work. UCSD Extension offers an excellent English language program during the summers as well as the academic year.

Applicants are judged competitively. Based on the candidate's background, qualifications, and goals, admission to the program is in one of three categories: M.S. only, M.S., or Ph.D. Admission to the M.S. only category is reserved for students for whom the M.S. degree is likely to be the terminal graduate degree. The M.S. designation is reserved for students currently interested in obtaining an M.S. degree but who at a later time may wish to continue in the doctoral degree program. Admission to the Ph.D. program is reserved for qualified students whose final aim is a doctoral degree.

Non-matriculated students are welcome to seek enrollment in graduate level courses via UC Extension's concurrent registration program, but an extension student's enrollment in a graduate course must be approved by the instructor.

Master's Degree Program

The M.S. program is intended to extend and broaden an undergraduate education with fundamental knowledge in different fields. The degree may be terminal, or obtained on the way to the Ph.D. The degree is offered under both the Thesis Plan I and the Comprehensive Examination Plan II.

M.S. Time Limit Policy: Full-time M.S. students are permitted seven quarters in which to complete all requirements. While there is no written time limit for part-time students, the department has the right to intervene and set individual deadlines if it becomes necessary.

Course requirements: All M.S. students must complete a total of 48 units which include a core of *five* courses (20 units) chosen among fluid dynamics (CENG 210A, MAE 210B), heat and mass transfer (CENG 221AB), kinetics (CENG 252), and mathematics. To maintain a certain balance in the core, no more than two mathematics courses should be chosen among the choices of applied mathematics (MAE 294AB or Math. 210AB), and numerical mathematics (MAE 290AB or Math. 270AB).

No more than three courses (12 units) of upper-division courses may be applied toward the total course work requirement. No more than a total of 8 units of CENG 296 and 298 may be applied toward the course work requirement. Units in seminars (CENG 259) may not be applied toward the degree requirement.

Thesis Plan I: Completion of the research thesis (CENG 299) fulfills 12 units toward the total graduation requirement. The balance is made up of the five core courses (20 units) and additional four elective courses (16 units) subject to the restrictions described above.

Comprehensive Examination Plan II: This plan involves course work only and culminates in an oral comprehensive examination based on topics selected from the core courses. In addition to the five core courses (20 units), one must choose an additional seven electives (28 units) subject to the restrictions of CENG 259, 296, and 298 described above. Sample electives are listed in the table below. A student should consult their academic adviser to choose an appropriate course schedule, including alternatives in bioengineering, electrical and computer engineering, materials science, basic sciences, and mathematics.

FALL	WINTER	SPRING
CORE SELECTIONS		
CENG 210A	CENG 221A	CENG 221B
MAE 290A or 294A	MAE 210B	CENG 252
	MAE 290B or 294B	
SUGGESTED ELECTIVES		
MS 201A	MS 201B	MS 201C
MAE 211	MAE 212	MAE 213
Math. 270A	Math. 270B	Math. 270C
Chem. 211	Chem. 212	Chem. 213

Change of Degree: Upon completion of the requirements for the M.S. degree, students admitted as M.S. *only* or M.S. candidates are not automatically eligible for admission to the Ph.D. program.

M.S. *only* and M.S. candidates who subsequently wish to pursue a doctorate must submit an application for a change in status to their examining committee. The application, if approved by the committee, must be signed by a faculty member who expects to serve as the student's Ph.D. adviser. The student must also submit a general petition for graduate students to effect the change of status. If the student elects the comprehensive examination plan for the M.S. degree, the examining committee may recommend that the comprehensive examination may replace the preliminary qualifying examination expected of Ph.D. students.

Doctoral Degree Program

The Ph.D. program is intended to prepare students for a variety of careers in research and teaching. The emphasis is on research. In general, there are no formal course requirements. All students, in consultation with their advisers, develop appropriate course programs that will prepare them for the Preliminary Qualifying Examination and for their dissertation research. These programs must be planned to meet the time limits established to advance to candidacy and to complete the requirements of the degree.

All Ph.D. students are required to pass three examinations. The first is a Preliminary Qualifying Examination which should be taken within three to four quarters of full-time graduate study. The second is the Ph.D. Qualifying Examination. The last is the Dissertation Defense.

Preliminary Qualifying Examination: The examination is intended to determine a candidate's basic understanding of engineering fundamentals and the candidate's ability to pursue successfully a research project at a level appropriate for the doctorate. The scope of the examination is based on topics selected from the core curriculum as listed under the M.S. degree program. A candidate is expected to demonstrate knowledge equivalent to these courses and formal enrollment record is not a prerequisite. The format is an oral examination administered by a committee of three faculty members in the Chemical Engineering Program. The candidate should present to the committee, prior to the examination, the five core courses that will constitute the basis of the examination.

Depth Requirement: A candidate must have the ability to perform in-depth analysis in the dissertation topic. A candidate should consult with the thesis adviser to develop a proper course program if it is deemed necessary. Depending on an individual's background and the nature of the research problem, a candidate should either complete a set of a minimum of four courses or demonstrate to the thesis adviser the equivalent knowledge and ability.

Ph.D. Qualifying Examination: Prior to taking this examination, the candidate must have completed the departmental qualifying examination, obtained a faculty research adviser, and must have made initial progress on a chosen dissertation project. At the time of application for advancement to candidacy, a doctoral committee responsible for the remainder of the student's graduate program is appointed by the Graduate Council under the policy listed in the Graduate Studies section of the General Catalog. The committee conducts the Ph.D. Qualifying Examina-tion, during which the student must demonstrate the ability to engage in thesis research. The process involves the presentation of a plan for the thesis research project. The committee may ask questions directly or indirectly related to the project and general questions that it determines to be relevant. Upon successful completion of the examination, subject to the UCSD time limit policy, the student is advanced to candidacy and is awarded the candidate in Philosophy degree (see "Graduate Studies" section in this Catalog).

Teaching Experience: Prior to the dissertation defense, the candidate must serve at least once as a teaching assistant with the responsibility to hold a problem-solving section one hour a week.

Dissertation Defense: This is the final Ph.D. examination. Upon completion of the dissertation research project, the candidate writes a dissertation that must be successfully defended in an oral examination and public presentation conducted by the doctoral committee. A complete copy of the student's dissertation must be submitted to each member of the doctoral committee four weeks before the defense. It is understood that this copy of the dissertation given to committee members will not be the final copy, and that the committee members may request changes in the text at the time of the defense. This examination may not be conducted earlier than three quarters after the date of advancement to doctoral candidacy. Acceptance of the dissertation by the Office of Graduate Studies and Research and the University Librarian represents the final step in completion of all requirements for the Ph.D. degree.

Ph.D. Time Limit Policy: Pre-candidacy status is limited to four years. Doctoral students are eligible for university support for six years. The defense and submission of the doctoral dissertation must be within seven years.

Annual Evaluation: In the spring of each year, the faculty adviser evaluates each doctoral student's overall performance in course work, research, and prospects for financial support for future years. A written assessment is given to the student after the evaluation. If a student's work is found to be inadequate, the faculty may determine that the student cannot continue in the graduate program.

COURSES

All students enrolled in CENG courses or admitted to the CENG program (including pre-majors) are expected to meet prerequisite and performance standards, i.e., students may not enroll in any CENG courses or courses in another department which are required for the major prior to having satisfied prerequisite courses with a C– or better. (The program does not consider D or F grades as adequate preparation for subsequent material.) Additional details are given under the program outline, course descriptions, and admission procedures for the Jacobs School of Engineering in this catalog.

LOWER-DIVISION

1. The Scope of Chemical Engineering (1)
Demonstrations and discussions of basic knowledge and the opportunities in chemical engineering for professional development. Introduction to campus library and computer resources. Use of personal software tools such as spreadsheeting and student edition of MATLAB. *Prerequisites: none. (P/NP grading only.)*

UPPER-DIVISION

CENG 100. Process Modeling and Computation in Chemical Engineering (4)
Introduction to elementary numerical methods with applications to chemical engineering problems using a variety of problem solving strategies. Error analysis. Concepts of mathematical modeling, material and energy balances and probability and statistics with applications to design problems. *Prerequisites: admission to the chemical engineering or bioengineering major only and grades of C– or better in MAE 9 or 10, and Chem. 6C.*

CENG 101A. Introductory Fluid Mechanics (4)
(Formerly CENG 103A) Kinematics and equation of motion; hydrostatics; Bernoulli's equation; viscous flows; turbulence, pipe flow; boundary layers and drag in external flows; applications to chemical engineering, bioengineering, and structural engineering. Students may not receive credit for both MAE 101A and CENG 101A-103A. *Prerequisites: admission to the major and grades of C– or better in Phys. 2A and Math. 21D or 20D, and 20E.*

CENG 101B. Heat Transfer (4)
(Formerly CENG 103C) Conduction, convection, radiation heat transfer; design of heat exchangers. Students may not receive credit for both MAE 101C and CENG 101B-103C. *Prerequisites: admission to the major and a grade of C– or better in CENG 103A-B or 101A.*

CENG 101C. Mass Transfer (4)
(Formerly CENG 103B) Diffusive and convective mass transfer in solids, liquids, and gases; steady and unsteady state; mass transfer coefficients; applications to chemical engineering and bioengineering. *Prerequisites: admission to the major and grade of C– or better in CENG 103A or 101A.*

CENG 102. Chemical Engineering Thermodynamics (4)
Thermodynamic behavior of pure substances and mixtures. Properties of solutions, phase equilibria. Thermodynamic cycles. Chemical equilibria for homogeneous and heterogeneous systems. *Prerequisites: grade of C– or better in CENG 100 and Chem. 131.* Enrollment restricted to chemical engineering pre-majors and majors only.

CENG 113. Chemical Reaction Engineering (4)
Principles of chemical reactor analysis and design. Experimental determination of rate equations, design of batch and continuous reactors, optimization of selectivity in multiple reactions, consideration of thermal effects and residence time distribution. Introduction to multi-phase reactors. *Prerequisites: grade of C– or better in CENG 100 and Chem. 6B.* (Chem. 132 may be taken concurrently)

CENG 120. Chemical Process Dynamics and Control (4)
Examination of dynamic linear and linearized models of chemical processes. Stability analysis. Design of PID controllers. Selection of control and manipulated variables. Root locus, Bode and Nyquist plots. Cascade, feed- forward and ratio controls. *Prerequisites: admission to the major and grades of C– or better in Math. 21D or Math. 20D.* (Students may not receive credit for both MAE 141A or MAE 143B and CENG 120).

CENG 122. Separation Processes (4)
Principles of analysis and design of systems for separation of components from a mixture. Topics will include staged operations (distillation, liquid-liquid extraction), and continuous operations (gas absorption, membrane separation) under equilibrium and nonequilibrium conditions. *Prerequisites: admission to the major and grades of C– or better in CENG 102 and CENG 103 or CENG 101C.*

CENG 124A. Chemical Plant and Process Design I (4)
Principles of chemical process design and economics. Process flow diagrams and cost estimation. Computer-aided design and analysis. Representation of the structure of complex, interconnected chemical processes with recycle streams. Ethics and professionalism. Health, safety, and the environmental issues. *Prerequisites: admission to chemical engineering major and grades of C– or better in CENG 122.*

CENG 124B Chemical Plant and Process Design II (4)
Engineering and economic analysis of integrated chemical processes, equipment, and systems. Cost estimation, heat and mass transfer equipment design and costs. Comprehensive integrated plant design. Optimal design. Profitability. *Prerequisites: admission to chemical engineering major and grade of C– or better in CENG 124A.*

CENG 176A. Chemical Engineering Process Laboratory I
Laboratory projects in the areas of applied chemical research and unit operations. Emphasis on applications of engineering concepts and fundamentals to solution of practical and research problems. *Prerequisites: admission to the major and grades of C– or better in CENG 122 and MAE 170.*

CENG 176B. Chemical Engineering Process Laboratory II
Training in planning research projects, execution of experimental work and articulation (both oral and written) of the research plan and results in the areas of applied chemical technology and engineering operations related to mass, momentum, and heat transfer. *Prerequisites: admission to the major and grade of C– or better in CENG 176A.*

CENG 199. Independent Study for Undergraduates (4-4)
Independent reading or research on a problem by special arrangement with a faculty member. *Prerequisite: consent of instructor.* (P/NP Only).

CHEMICAL ENGINEERING GRADUATE COURSES

CENG 205. Graduate Seminar in Chemical Engineering (1)
Each graduate student in CENG is expected to attend one seminar per quarter, of his or her choice, dealing with current topics in chemical engineering. Topics will vary. *Prerequisites: none.*

CENG 210A. Fluid Mechanics I (4)
Basic conservation laws, flow kinematics. The Navier-Stokes equations and some of its exact solutions, non-dimensional parameters and different flow regimes, vorticity dynamics. Cross-listed with MAE 210A. *Prerequisites: MAE 101AB and MAE 110A or consent of instructor.*

CENG 221A Heat Transfer (4)
Conduction, convection, and radiation heat transfer development of energy conservation equations. Analytical and numerical solutions to heat transport problems. Specific topics and applications vary. Cross-listed with MAE 221A. *Prerequisites: MAE 101ABC or CENG 103ABC or consent of instructor.*

CENG 221B Mass Transfer (4)
Fundamentals of diffusive and convective mass transfer and mass transfer with chemical reaction. Development of mass conservation equations. Analytical and numerical solutions to mass transport problems. Specific topics and applications will vary. Cross-listed with MAE 221B. *Prerequisites: MAE 101ABC or CENG 103ABC or consent of instructor.*

CENG 251. Thermodynamics (4)
Principles of thermodynamics of single and multi-component systems. Phase equilibria. Estimation, calculation, and correlation of properties of liquids and gases. *Prerequisite: consent of instructor.*

CENG 252. Chemical Reaction Engineering (4)
Analysis of chemical rate processes; complex kinetic systms. Chemical reactor properties in steady state and transient operations; optimal design policies. The interaction of chemical and physical transport processes in affecting reactor design and operating characteristics. Uniqueness/multiplicity and stability in reactor systems. Applications of the heterogeneous reactor systems. *Prerequisite: consent of instructor.*

CENG 253. Heterogeneous Catalysis (4)
Physics and chemistry of heterogeneous catalysis. Adsorption/desorption kinetics, chemical bonding, isotherms, kinetic models, selection of catalysts, poisoning, experimental techniques. *Prerequisite: consent of instructor.*

CENG 254. Biochemical Engineering Fundamentals (4)
Introduction to microbiology as relevant to the main topic, biological reactor analysis. Fermentation and enzyme technology. *Prerequisite: consent of instructor.*

CENG 255. Electrochemical Engineering (4)
Fundamentals of electyrochemistry and electrochemical engineering. Structure of the double layer, cell potential and electrochemical thermodynamics, charge transfer kinetics, electrochemical transport phenomena, and introduction to colloidal chemistry. Applications such as corrosion prevention, electroplating, reacgtor design, batteries and fuel cells. *Prerequisite: consent of instructor.*

CENG 258. Special Topics in Chemical Engineering (4)
Directed studies in chemical engineering using topics not covered in regular course offerings. *Prerequisites: consent of instructor.*

CENG 259. Seminar in Chemical Engineering (4)
Presentations on research progress by graduate students and by visitors from industrial and academic research laboratories. (May be repeated for credt. S/U grades only). *Prerequisite: consent of instructor.*

CENG 296. Independent Study in Chemical Engineering (4)
Independent reading or research on a problem as arranged by a faculty member. Must be taken for a letter grade only. *Prerequisite: consent of instructor.*

CENG 299. Graduate Research in Chemical Engineering (1-12)
S/U grades only. *Prerequisite: consent of instructor.*

Computer Science and Engineering (CSE)

OFFICES:
Undergraduate Affairs 3402
Graduate Affairs 3402
Applied Physics and Mathematics Building, Muir College
http://www.cs.ucsd.edu

Professors

Donald W. Anderson, Ph.D., *Emeritus*
Scott B. Baden, Ph.D.
Mihir Bellare, Ph.D.
Francine D. Berman, Ph.D.
Kenneth L. Bowles, Ph.D., *Emeritus*
Walter A. Burkhard, Ph.D.
J. Lawrence Carter, Ph.D.
Chung-Kuan Cheng, Ph.D.
Andrew Chien, Ph.D.
Garrison W. Cottrell, Ph.D.
Jeanne Ferrante, Ph.D.
Joseph A. Goguen, Ph.D.
Fan Chung Graham, Ph.D.
Ronald L. Graham, Ph.D.
William G. Griswold, Ph.D.
Rajesh Gupta, Ph.D.
William E. Howden, Ph.D.
T. C. Hu, Ph.D.
Russell Impagliazzo, Ph.D.
Ramesh C. Jain, Ph.D., *Emeritus*
Andrew B. Kahng, Ph.D.
Sidney Karin, Ph.D.
David Kriegman, Ph.D.
Keith Marzullo, Ph.D.
Alex Orailoglu, Ph.D.
Alon Orlitsky, Ph.D.
Joseph C. Pasquale, Ph.D.
Ramamohan Paturi, Ph.D.
Pavel A. Pevzner, Ph.D.
Venkat P. Rangan, Ph.D.
Walter J. Savitch, Ph.D., *Emeritus*
Larry L. Smarr, Ph.D.
George Varghese, Ph.D.
Victor D. Vianu, Ph.D.
S. Gill Williamson, Ph.D.

Associate Professors

Bradley G. Calder, Ph.D.
Charles P. Elkan, Ph.D.
Yannis Papakonstantinou, Ph.D.
Dean M. Tullsen, Ph.D.
M. Amin Vahdat, Ph.D.
Alexander Vardy, Ph.D.

Assistant Professors

Vineet Bafna, Ph.D.
Serge J. Belongie, Ph.D.
Sanjoy Dasgupta, Ph.D.
Alin Deutsch, Ph.D.
Eleazar Eskin, Ph.D *(In-Residence)*
Henrick Wann Jensen, Ph.D.
Ingolf Krueger, Ph.D. *(In-Residence)*
Daniele Micciancio, Ph.D.
Stefan Savage, Ph.D.
Alex Snoeren, Ph.D.
Geoffrey Voelker, Ph.D.

Adjunct Faculty

Michael J. Bailey, Ph.D.
Samuel R. Buss, Ph.D.
Henri Casanova, Ph.D.
Walter H. Ku, Ph.D.
Bertram Ludaescher, Ph.D.
Jeffrey Remmel, Ph.D.
J. Benjamin Rosen, Ph.D.
George Polyzos, Ph.D.
Jeffrey B. Remmel, Ph.D.
Terrence J. Sejnowski, Ph.D.
Allan Snavely, Ph.D.

Research Faculty

Philip Papadopoulos, Ph.D., *Associate Research Scientist*

Academic Coordinator

Paul Kube, Ph.D., *Lecturer with Security of Employment*

The Undergraduate Programs

The Department of Computer Science and Engineering offers computer science and computer engineering curricula leading to the degrees in B.S. in Computer Science, B.S. in Computer Engineering, B.A. in Computer Science, and B.S. in Computer Science with a specialization in Bioinformatics. The courses of study prepare students for graduate study in these fields as well as immediate employment. The B.A. degree is intended to provide a more flexible program of study allowing significant studies beyond computer science and engineering.

These degrees are four-year endeavors. Students in the B.S. programs need to enroll in no more than sixteen units per quarter during their junior and senior years to meet their major requirements. The B.A. program has fewer major requirements. In addition, each student must satisfy general-education course requirements determined by the student's college.

B.S. Computer Science Program

The lower-division B.S. computer science program is designed to provide a strong foundation in mathematics, physics, electrical engineering, programming methodology and skills, and computer organization. Upper-division core courses deal with the theory and design of algorithms, hardware, and software. Students can gain additional breadth and/or depth in computer science and engineering by an appropriate selection of technical electives.

Students should have sufficient background in high school mathematics so that they can take freshman calculus in their first quarter. Courses in high school physics and computer program-

ming, although helpful, are not required for admission to the program.

The department requires a total of 135 units for the B.S. computer science program (not including the general-education requirements). There are three varieties of requirements: lower-division, upper-division, and technical electives.

1. LOWER-DIVISION REQUIREMENTS

Students are expected to complete the following seventy units by the end of their sophomore year.

Computer Science and Engineering: CSE 8B or 11, 12, 20 or Math. 15A, CSE 21 or Math. 15B, CSE 30, and CSE 91; twenty-one units.

Note: Students without any programming experience are advised to take CSE 8A and then CSE 8B, instead of CSE 11. CSE 11 is a faster paced version of CSE 8A and CSE 8B, and requires experience in programming with a compiled language.

Mathematics: Math. 20A-B-C-D and 20F; twenty units.

Physics: Phys. 2A-B-C; 12 units. Math. 20A is a prerequisite for Phys. 2A. Students whose performance on the Department of Mathematics placement test permits them to start with Math. 20B or a higher course may take Phys. 2A in the fall quarter of the freshman year; all others will take Phys. 2A in the winter quarter of the freshman year. Students who received high grades in both calculus and Physics in high school may substitute the major's sequence, Phys. 4A-B-C for Phys. 2A-B-C.

Physics Lab: Phys. 2BL or 2CL or 2DL; two units. The lab course should be taken concurrently with the Phys. 2 or Phys. 4 sequence.

Introduction to Electrical Engineering: ECE 53A-B; eight units. ECE 53A-B are courses that give a comprehensive introduction to electrical engineering.

Probability and Statistics: Math.183; four units.

Science/Mathematics Elective: Students are required to take one of the following four-unit science/mathematics courses: Phys. 2D, Math. 20E(2F), Chem. 6A, BILD 1, 10, 12, 14, 30.

2. UPPER-DIVISION REQUIREMENTS

All B.S. computer science students are required to take CSE 100 or Math. 176, CSE 101 or Math. 188, CSE 105 or Math. 166, CSE 120, 130, 131A-B, 140, 140L, 141 and 141L; forty units.

Students are expected to complete almost all of these courses by the end of their junior year. If students want to accelerate their program, they should consider taking CSE 100 or Math. 176, CSE 105, and/or CSE 140 and 140L in the sophomore year.

3. TECHNICAL ELECTIVES

B.S. computer science students are required to take six technical electives for a total of twenty-four units. Four electives must be computer science and engineering upper-division or graduate courses.

The remaining two technical electives can be chosen from the wider set of courses that includes computer science and engineering upper-division courses, graduate courses, and other electives as listed under the section titled **Electives**. Other restrictions in the selection of technical electives are also given in the section **Electives**.

4. B.S. COMPUTER SCIENCE, SAMPLE PROGRAM

FALL	WINTER	SPRING
FRESHMAN YEAR		
CSE 8A or CSE 11	CSE 12	CSE 20 or
Math. 20A	Math. 20B	Math. 15A
GE	Phys. 2A	Math. 20C
CSE 91	GE	Phys. 2B
		GE
SOPHOMORE YEAR		
CSE 21 or Math. 15B	Sci/Math. Elec.	CSE 30
Math. 20D	Math. 20F	Math. 183
GE	ECE 53A	Phys. 2BL or
GE	Phys. 2C	2CL or 2DL
		ECE 53B
JUNIOR YEAR		
CSE 100 or Math. 176	CSE 101 or Math. 188	CSE 120
CSE 140	CSE 141	CSE 130
CSE 140L	CSE 141L	CSE Tech. Elec.
CSE 105 or Math. 166	CSE Tech. Elec.	GE
GE	GE	
SENIOR YEAR		
CSE 131A	CSE 131B	CSE Tech. Elec.
CSE Tech. Elec.	Tech. Elec.	Tech. Elec.
GE	GE	GE

B.S. Computer Engineering Program

(Curriculum is the same in both the CSE and ECE departments.)

The B.S. computer engineering program is jointly administered by the Departments of Computer Science and Engineering and Electrical and Computer Engineering. Students wishing to take the computer engineering program must be admitted to one of the departments.

The lower-division computer engineering program is designed to provide a strong foundation in mathematics, physics, electrical engineering, programming methodology and skills, and computer organization. Upper-division core courses deal with the theory and design of algorithms, hardware and software, as well as electronic systems. Students can gain additional breadth and/or depth in computer science and engineering by an appropriate selection of technical electives.

Students should have sufficient background in high school mathematics so that they can take freshman calculus in their first quarter. Courses in high school physics and computer programming, although helpful, are not required for admission to the program.

B.S. computer engineering program requires a total of 147 units (not including the general-education requirements). There are three varieties of requirements: lower-division, upper-division, and technical electives.

1. LOWER-DIVISION REQUIREMENTS

Students are expected to complete the following seventy units by the end of their sophomore year.

Computer Science and Engineering: CSE 8B or 11, 12, 20 or Math. 15A, CSE 21 or Math. 15B, CSE 30, and CSE 91; twenty-one units.

Note: Students without any programming experience are advised to take CSE 8A and then CSE 8B, instead of CSE 11. CSE 11 is a faster paced version of CSE 8A and CSE 8B, and requires experience in programming with a compiled language.

Mathematics: Math. 20A-B-C-D and 20F; twenty units.

Physics: Phys. 2A-B-C-D; sixteen units. Math. 20A is a prerequisite for Phys. 2A. Students whose performance on the Department of Mathematics placement test permits them to start with Math. 20B or a higher course may take Phys. 2A in the fall quarter of the freshman year; all others will take Phys. 2A in the winter quarter of the freshman year. Students who received high grades in both calculus and physics in high school may substitute the major's sequence, Phys. 4A-B-C-D for Phys. 2A-B-C-D.

Physics Lab: Phys. 2BL or 2CL or 2DL; two units. The lab courses should be taken concurrently with the Phys. 2 or Phys. 4 sequence.

Introduction to Electrical Engineering: ECE 53A-B; eight units. ECE 53A-B are courses that give a comprehensive introduction to electrical engineering.

Probability and Statistics: ECE 109; four units. This course can be taken in the sophomore year.

2. UPPER-DIVISION REQUIREMENTS

All B.S. computer engineering students are required to take CSE 100 or Math. 176, CSE 101 or Math. 188, CSE 105 or Math. 166, CSE 120, 131A-B, 140, 140L, 141, and 141L; thirty-six units.

In addition, all B.S. computer engineering students have to fulfill the following upper-division ECE requirements.

Linear Systems: ECE 101, ECE 171A or 161A; eight units. The department recommends that these courses be taken in the junior year.

Electronic Circuits and Systems: ECE 102, ECE 108; eight units. The department recommends that these courses be taken in the junior year.

If students want to accelerate their program, they should consider taking CSE 100 or Math. 176, CSE 105 or Math. 166, and/or CSE 140 and 140L in the sophomore year.

3. TECHNICAL ELECTIVES

All B.S. computer engineering students are required to take six technical electives for a total of twenty-four units. One of these courses must be either ECE 111 or ECE 118. Of the remaining five courses, four must be computer science and engineering or electrical and computer engineering upper-division or graduate courses.

The remaining course can be any computer science and engineering or electrical and computer engineering upper-division or graduate course, or any other course listed under the section titled **Electives**. Other restrictions in the selection of technical electives are also given in the section **Electives**.

4. B.S. COMPUTER ENGINEERING, SAMPLE PROGRAM

FALL	WINTER	SPRING
FRESHMAN YEAR		
CSE 8A or CSE 11	CSE 12	CSE 20
Math. 20A	Math. 20B	or Math. 15A
GE	Phys. 2A	Math. 20C
CSE 91	GE	Phys. 2B
		GE
SOPHOMORE YEAR		
CSE 21 or Math. 15B	Math. 20F	CSE 30
Math. 20D	ECE 53A	ECE 53B
Phys. 2C	ECE 109	Phys. 2D
GE	GE	Phys. 2BL or
		2CL or 2DL
JUNIOR YEAR		
CSE 100 or Math. 176	CSE 101 or Math. 188	CSE 105 or
CSE 140	CSE 141	Math. 166
CSE 140L	CSE 141L	CSE 120
ECE 102	ECE 108	(Req. Tech. Elec.-
GE	GE	ECE 111 or
		#ECE 118)
		GE
SENIOR YEAR		
CSE 131A	CSE 131B	ECE 171A or
ECE 101	CSE/ECE Tech. Elec.	161A
CSE/ECE Tech. Elec.	CSE/ECE Tech. Elec	CSE/ECE Tech.
GE.	GE	Elec.
		Tech. Elec.
		GE

B.S. Computer Science with a specialization in Bioinformatics

The explosion in biological knowledge spawned by the various genome projects has created entirely new fields and industries, and a need for trained computational biologists who are familiar with biology, mathematics, and computer sciences. The Computer Science and Engineering Department offers rigorous, interdisciplinary training in the new and rapidly evolving field of bioinformatics. Bioinformatics refers to advanced computational and experimental methods that model the flow of information (genetic, metabolic, and regulatory) in living systems to provide an integrated understanding of the system properties of organisms. This interdisciplinary major will be offered by three other programs (Division of Biology, Department of Chemistry and Biochemistry, and Department of Bioengineering). The computer science and engineering requirements comprise of 152 units to be taken from the divisions of physical sciences, biology, and engineering.

1. LOWER-DIVISION REQUIREMENTS

Lower-division requirements, 64 units: Students are expected to complete all lower-division requirements by the end of their sophomore year.

1. Math. 20A, 20B, 20C, 20F, (16 units)
2. Chemistry 6A, 6B, 6C, and one lab (15 units)
3. BILD 1, BILD 2, and BILD 94 (9 units)
4. CSE 11, CSE 12, and CSE 21 or Math. 15B (12 units)
5. Physics 2A, 2B, 2C (12 units)

2. UPPER-DIVISION REQUIREMENTS

Upper-division requirements, 88 units (includes five CSE technical electives)

1. CSE 100 or Math. 176 (Data Structures), (4 units)
2. CSE 101 or Math. 188 (Algorithms), (4 units)
3. Chemistry 140A–140B (Organic Chemistry), (8 units)
4. Chemistry 114B (Biochemical Energetics and Metabolism) or BIBC 102 (Structural and Metabolic Biochemistry) (4 units)
5. BIBC 103 (Biochemical Techniques), (4 units)
6. BICD 100 (Genetics), (4 units)
7. BIMM 100 (Molecular Biology) or Chemistry 114D (Molecular and Cellular Biochemistry), (4 units)
8. BIMM 101 (Recombinant DNA Lab), (4 units)
9. BICD 110 (Cell Biology), (4 units)
10. BIBC 110 (Physical Biochemistry) or Chemistry 127 (Physical Chemistry), (4 units)
11. Five additional CSE upper-division electives (electives 1, 2, 3, 4, and 5).

    At least one course from each of the three groups for a total of five electives:

    Group I: CSE 30, 111, 131A, 131B, 134A

    Group II: CSE 105, 150, 151, Math. 184A

    Group III: CSE 132A, 132B, 133

The bioinformatics series comprised of the following six courses, 24 units:

12. CSE 181 or BIMM 181 or BENG 181 (Molecular Sequence Analysis), (4 units)
13. CSE 182 or BIMM 182 or BENG 182 or Chem. 182 (Biological Databases), (4 units)
14. BENG 183 (Applied Genomic Technologies), (4 units)
15. CSE 184 or BIMM 184 or BENG 184 (Computational Molecular Biology), (4 units)
16. BIMM 185 (Bioinformatics lab), (4 units)
17. Math. 186 (Probability and Statistics), (4 units)

3. B.S. COMPUTER SCIENCE WITH A SPECIALIZATION IN BIOFORMATICS, SAMPLE PROGRAM

FALL	WINTER	SPRING
FRESHMAN YEAR		
CSE 8A+8B	CSE 12	BILD 94[2]
or 11[1]	Math. 20B	Math. 20C
Math. 20A	Chem. 6B	Chem. 6C
Chem. 6A	Chem. 6BL	BILD 1
GE 1	GE 2	GE 3

SOPHOMORE YEAR		
CSE 21 or Math. 15B	Math. 20F	Chem. 140B
BILD 2	Phys. 2B	BIBC 103
Phys. 2A	Chem. 140A	Phys. 2C
GE 4	GE 5	GE 6
JUNIOR YEAR		
CSE 100 or Math. 176[3]	CSE 101 or Math. 188	CSE 181[4] BIMM 101
or		
BICD 100	Math. 186	Chem. 112B
GE 7	BIBC 102 or Chem. 114B	BICD 110
GE 8	BIMM 100 or Chem. 114D	BIBC 110 or Chem. 127
SENIOR YEAR		
CSE 182	CSE 184	BIMM 185
BENG 183	Elec. 2	Elec. 4
Elec. 1[5]	Elec. 3	Elec. 5
GE 9	GE 10	GE 11

[1] Students may take the slower paced version, CSE 8A + CSE 8B, instead of CSE 11.

[2] BILD 94 (1 unit seminar) is recommended in students first spring quarter of study at UCSD. This course gives an overview of issues and topics in bioinformatics.

[3] CSE 30 prerequisite will be waived.

[4] New courses for the bioinformatics program: CSE 181 is cross-listed with BIMM 181 and BENG 181; CSE 182 is cross-listed with BIMM 182, Chem 182, and BENG 182; CSE 184 is cross-listed with BIMM 184 and BENG 184; and (BENG 183, BIMM 185, and Math. 186 are also new courses but they are not cross-listed with any other courses).

[5] Students must complete five CSE technical electives from the approved list.

B.A. Computer Science Program

The B.A. computer science program gives students more latitude in designing their course of study. The lower-division program is designed to provide a strong foundation in mathematics, physics, programming methodology and skills, and computer organization. Upper-division core courses deal with the theory and design of algorithms, hardware, and software. Students can gain additional breadth and/or depth in computer science and engineering by an appropriate selection of technical electives. By requiring fewer technical electives, the B.A. computer science program serves those students desiring more time for undergraduate studies outside their major subject.

The department requires a total of 105 units for the B.A. computer science program (not including the general-education requirements). There are three varieties of requirements: lower-division, upper-division, and technical electives.

1. LOWER-DIVISION REQUIREMENTS

Students are expected to complete the following fifty-two units by the end of their sophomore year.

Computer Science and Engineering: CSE 8B or 11, 12, 20 or Math. 15A, CSE 21 or Math. 15B, CSE 30, and CSE 91; twenty-one units.

Note: Students without any programming experience are advised to take CSE 8A and then CSE 8B, instead of CSE 11. CSE 11 is a faster paced version of CSE 8A and CSE 8B, and requires experience in programming with a compiled language.

Mathematics: Math. 20A-B-C-D and 20F; twenty units.

Physics: Phys. 2A-B-C; twelve units. Math. 20A is a prerequisite for Phys. 2A. Students whose performance on the Department of Mathematics placement test permits them to start with Math. 20B or a higher course may take Phys. 2A in the fall quarter of the freshman year; all others will take Phys. 2A in the winter quarter of the freshman year. Students who received high grades in both calculus and physics in high school may substitute the major's sequence, Phys. 4A-B-C for Phys. 2A-B-C.

2. UPPER-DIVISION REQUIREMENTS

All B.A. computer science students are required to take CSE 100 or Math. 176, CSE 101 or Math. 188, CSE 105 or Math. 166, CSE 120, 131A, 131B, 140, 140L, 141, and 141L; thirty-six units.

Students are expected to complete almost all of these courses by the end of their junior year. If students want to accelerate their program, they should consider taking CSE 100 or Math. 176, CSE 105 or Math. 166, and/or CSE 140 and 140L in the sophomore year.

3. TECHNICAL ELECTIVES

B.A. computer science students are required to take four technical electives for a total of sixteen units. Of these four electives, at least two must be computer science and engineering upper-division or graduate courses.

The remaining two technical electives can be chosen from a wider set of courses that includes computer science and engineering upper-division courses, graduate courses, and other electives as listed under the section titled **Electives**. Other restrictions in the selection of technical electives are also given in the section **Electives**.

4. B.A. COMPUTER SCIENCE, SAMPLE PROGRAM

FALL	WINTER	SPRING
FRESHMAN YEAR		
CSE 8A or CSE 11	CSE 12	CSE 20
Math. 20A	Math. 20B	or Math. 15A
GE	Phys. 2A	Math. 20C
CS 91	GE	Phys. 2B
		GE
SOPHOMORE YEAR		
CSE 21 or Math. 15B	Math. 20F	CSE 30
Math. 20D	GE	GE
Phys. 2C	GE	GE
JUNIOR YEAR		
CSE 100 or Math. 176	CSE 101 or Math. 188	CSE 120
CSE 140	CSE 141	CSE Tech. Elec.
CSE 140L	CSE 141L	GE
CSE 105 or Math. 166	GE.	GE
SENIOR YEAR		
CSE 131A	CSE 131B	Tech. Elec.
CSE Tech. Elec.	Tech. Elec.	
GE		

Electives

The discipline of computer science and engineering interacts with a number of other disciplines in a mutually beneficial way. These disciplines include mathematics, electrical engineering, and cognitive science. The following is a list of upper-division courses from these and other disciplines that can be counted as technical electives.

At most four units of CSE 197, 198, or 199 may be used towards technical elective requirements. CSE 195 cannot be used towards course requirements. Undergraduate students must get instructor's permission and departmental stamp to enroll in a graduate course.

Students may not get duplicate credit for equivalent courses. The *UCSD General Catalog* should be consulted for equivalency information and any restrictions placed on the courses. Additional restrictions are noted below. Any deviation from this list must be petitioned.

Mathematics: All upper-division courses except Math. 168A-B, 179A-B (Math. 183—Computer Engineering majors only), 184A-B, 189A-B, and 195–199.

If a student has completed CSE 167, then he or she cannot get elective credit for Math. 155A. Students may receive elective credit for only one of the following courses: CSE 164A, Math. 174, Math. 173, Phys. 105A-B, CENG 100, MAE 107. No credit for any of these courses will be given if Math. 170A-B-C is taken. Students may receive credit for either one of the following: Math. 166 or

CSE 105 (but not both), Math. 188 or CSE 101 (but not both), Math. 176 or CSE 100 (but not both).

Credit will be given for only one of the following: ECE 109 or Math. 183 or Econ. 120A.

Electrical and Computer Engineering: All ECE upper-division courses except 195-199.

Students may not get credit for both CSE 123A and ECE 158A or CSE 143 and ECE 165. Credit will be given for only one of the following: ECE 109 or Math. 183 or Econ. 120A.

Cognitive Science: Sensation and Perception 101A; Learning, Memory, and Attention 101B, Language 101C, Distributed Cognition 102A, Cognitive Ethnography 102B, Cognitive Engineering 102C, Neuroanatomy and Physiology 107A, Systems Neuroscience 107B, Cognitive Neuroscience 107C, Programming Methods for Cognitive Science 108D, Neural Network Models of Cognitive I 108E, Advanced Programming Methods for Cognitive Science 108F, Human Computer Interaction 120, Human Computer Interaction Programming 121, Semantics 150, Language Comprehension 153, Natural and Artificial Symbolic Representational Systems 170, Neural Network Models of Cognition II 181, Artificial Intelligence Modeling II 182, Representation, Search, and the Web 188.

Students may not get credit for both CSE 150 and Advanced Programming Methods for Cognitive Science 108F or for both CSE 151 and Artificial Intelligence Modeling II 182.

Mechanical and Aerospace Engineering: All upper-division MAE courses except MAE 140 (**ONLY** Computer Science majors may take MAE 140) and 195-199.

Students may receive elective credit for only one of the following courses: CSE 164A, Math. 174, Math. 173, Phys. 105A-B, CENG 100, MAE 107. Students may only get credit for one of the two courses, CSE 167 or MAE 152.

Economics: Microeconomics 100A-B, Game Theory 109, Macroeconomics 110A-B, Mathematical Economics 113, Econometrics 120A-B-C, Applied Econometrics 121, Management Science Microeconomics 170A-B, Decisions Under Uncertainty 171, Introduction to Operations Research 172A-B-C, Economic and Business Forecasting 178.

Credit will be given for only one of the following: ECE 109 or Math. 183 or Econ. 120A.

Linguistics: Phonetics 110, Phonology I 111, Phonology II 115, Morphology 120, Syntax I 121, Syntax II 125, Semantics 130, Mathematical Analysis of Language 160, Computers and Language 163, Computational Linguistics 165, Principles of Discourse and Dialog 169, Psycholinguistics 170, Language and the Brain 172, and Sociolinguistics 175.

Engineering: Team Engineering 101.

Music: Computer Music II 172, Audio Production: Mixing and Editing 173.

Psychology: Engineering Psychology 161

Minor and Program of Concentration

The CSE minor requires successful completion of a total of nine CSE courses. To be admitted into the minor, students must have a 2.5 GPA and a C– or better in CSE 8B or 11, 12, 20, 21, 30. The remaining four CSE courses are CSE 100, CSE 101, and two additional CSE upper-division courses subject to enforcement of prerequisites. In order for the minor to be awarded students must receive an average 2.0 GPA in the upper-division courses.

Note: Students without any programming experience are advised to take CSE 8A and then CSE 8B, instead of CSE 11. CSE 11 is a faster paced version of CSE 8A and CSE 8B, and requires experience in programming with a compiled language.

Students should consult their college provost's office concerning the rules for the minor or program of concentration. Because our undergraduate program is highly impacted, winter or spring enrollment is recommended for CSE 8A or CSE 8B or CSE 11.

Effective Fall 2000, Mathematics/Computer Science Majors will not be allowed the Minor in Computer Science.

Computing Courses for Non-Majors

The department offers a slow-pace course providing a practical introduction to computers, computation, and programming: CSE 5A—an introduction to structured programming using the C/Java programming language. We also offer an introduction in "fluency in information technology": CSE 3—an introduction to basic information students need to deal with information technology. It is more of a concepts course than a programming course, but some simple programming will be done as part of the teaching of concepts.

Admission to Major

FRESHMEN STUDENTS

Freshman students who have excelled in high school and have declared CSE on their application will be directly admitted by the dean of the School of Engineering into their major. The only way to become a computer science (CS) or computer engineering (CE) major is to be directly admitted as an entering freshman (transfer students see TRANSFER STUDENTS section below) These students will be notified directly of their status.

Because of heavy student interest in departmental programs, and the limited resources available to accommodate this demand, maintenance of a high quality program makes it necessary to limit enrollments to the most qualified students.

Admission to the department as a major, transfer, or minor is in accordance with the general requirements established by the School of Engineering.

TRANSFER STUDENTS

The B.S. or B.A. in Computer Science and the B.S. in Computer Engineering are heavily impacted majors and admission is limited to applicants who have demonstrated a high level of achievement commensurate with the prospect of success in these majors. Successful applicants must have completed substantial training at the community college and must have achieved a high level of academic performance there. For example, the required minimum of 90 quarter transfer units must include 18 quarter units of calculus, 12 quarter units of calculus-based physics, and the highest level computer science course offered at their community college.

Effective fall 2001 applicants seeking admission as transfer students will be considered for direct admission into the Computer Science (CS) or Computer Engineering (CE) majors in the Department of Computer Science & Engineering (CSE). The only way to become a computer science (CS) or computer engineering (CE) major is to be directly admitted as an entering transfer student. Although the actual required GPA cutoff depends on the number of openings, at least a 3.2 GPA in the community college transfer courses, and a 3.4 GPA in math, physics and computer science courses, are likely to be needed to gain admission. Transfer students who have declared pre-CSE will be considered for direct admission to the major.

Effective **fall 2004**, it is **strongly recommended** that transfer students complete the following preparation for engineering majors*:

- Calculus I—for Science and Engineering (Math. 20A)

- Calculus II—for Science and Engineering (Math. 20B)
- Calculus and Analytic Geometry (Math. 20C)
- Differential Equations (Math. 20D)
- Linear Algebra (Math. 20F)
- Complete calculus-based physics series with lab experience (Physics 2A-B-C)
- Chemistry 6A (except Computer Science and Computer Engineering majors)
- Highest level of introductory computer programming language course offerings at the community college**

*Effective **fall 2006**, these courses will be **required** preparation for all engineering transfer students.

**Refer to the *UCSD General Catalog* to select major prerequisite requirement for computer language courses.

CONTINUING UCSD STUDENTS
Exceptional Admission Program

Space permitting and in its sole discretion, the computer science and engineering department may periodically grant admission to the Computer Science (CS) or Computer Engineering (CE) majors to a small number of academically exceptional UCSD undergraduate students who were not admitted to these majors as entering students. Exceptional admission will be considered for students having an overall UCSD GPA of 3.5 or better who have taken at least two CSE, math, or science courses demonstrating special aptitude for the CS or CE curriculum. Applications for exceptional admission must include submission of a course plan demonstrating ability to satisfy graduation requirements and a personal statement addressing the applicant's motivation to join the CS or CE major, in addition to other criteria established by the department. (For admission into the B.S. in Computer Science with specialization in Bioinformatics, please see the following section: Admission into B.S. in Computer Science with specialization in Bioinformatics).

Admission into B.S. in Computer Science with a specialization in Bioinformatics

Since the number of pre-majors and majors will be limited as described in the section on bioinformatics, student demand may exceed capacity. Therefore, admission to the specialization is not guaranteed and will be based on academic excellence, as described below. Since bioinformatics is an interdisciplinary major, a steering committee involving faculty from the participating departments will select among the best candidates applying and recommended through each department, while insuring active participation of the departments and divisions offering the major. The final decision on admission to the pre-major and major will be made by the Bioinformatics Steering Committee, in consultation with the departments. The application is found at http://www.cse.ucsd.edu/undergrad/admissions/admissionshome.html, or see the CSE department at AP&M 3402.

FRESHMEN AND CONTINUING STUDENTS

Students (freshmen or continuing UCSD students) will be admitted into one of our existing undergraduate majors (B.A. Computer Science, B.S. Computer Science, and B.S. Computer Engineering) through the direct admission process or through the exceptional admission program. Students will then have the option of trying to enter the bioinformatics program by applying for the bioinformatics pre-major (while still retaining their current major status) once they complete the first four screening courses (Math 20B, Math 21C, BILD 1, Chem 6A). Students will then formally apply to the bioinformatics major upon completion of the remaining screening courses CSE 11 and CSE 12. If admitted, students will become bioinformatics majors in CSE. If not, they can continue in their current CSE major.

TRANSFER STUDENTS

Transfer students will be admitted into one of our existing undergraduate majors (B.A. Computer Science, B.S. Computer Science, and B.S. Computer Engineering) through the direct admission process or through the exceptional admission program. Effective fall 2003, CSE transfer students can directly apply to the bioinformatics major if they completed the following courses prior to transferring to UCSD.

- A year of calculus (equivalent to Math 20A-B-C at UCSD)
- A year of general chemistry, with lab (equivalent to Chem 6A, 6B/6BL and Chem 6C at UCSD)
- The highest level programming course offered at the community college (equivalent to CSE 11 and CSE 12 at UCSD)
- One semester of cell biology (equivalent to BILD 1 and BILD 2 at UCSD)

Those who have not completed the above courses may be admitted as bioinformatics pre-majors and will be allowed a maximum of three quarters to complete pre-major requirements. Students will then formally apply to the bioinformatics major upon completion of the remaining screening courses CSE 11 and CSE 12. If admitted, students will become bioinformatics majors in CSE. If not, they can continue in their current CSE major. Transfer students are encouraged to complete these requirements at the community college.

Enrollment in CSE courses

Student demands exceed capacity in many CSE courses. Accordingly, many CSE courses may have enrollment restrictions which give priority to students in the following order:

1. CSE majors, CSE M.S., and CSE Ph.D. students.
2. CSE pre-majors, and ECE CE majors and pre-majors, and Math-CS majors. CSE pre-major status is conferred to transfer students and to those students admitted prior to fall 1998.
3. Students fulfilling a non-elective requirement in another program.
4. CSE minors.
5. All other majors or pre-majors in other SOE departments.
6. All others, with permission of the department of Computer Science and Engineering.

Where these restrictions apply, the registrar will not enroll low-priority students in the course.

ENROLLING IN UPPER-DIVISION COURSES

The Department of Computer Science and Engineering will attempt to provide sufficient sections of all lower-division courses. Students will, however, be screened to ensure that they meet all course enrollment restrictions.

Admission to upper-division courses will be restricted to students having completed all prerequisites with a C- or better (or consent of the instructor.) Courses have enrollment restrictions which give priority in the following order: students admitted by the department to a major or minor curriculum; students fulfilling a requirement for another major; all others. Within these categories, priority is determined on the basis of graduation date and/or credits completed.

Where these restrictions apply, the registrar will not enroll nonmajors except by department approval. Students who are undeclared will not be admitted to upper-division computer science and engineering courses.

Those students not in compliance with the above restrictions should be forewarned that they will automatically be dropped from course rosters (at any time during the quarter) when it comes to the attention of the department that a student is enrolled in a course without being eligible because of restrictions and/or the performance standards have not been met. Admission to all computer science and engineering courses will require obtaining either authorization through StudentLink or department stamps on an add/drop card, and it will be given only by the student affairs personnel.

Graduation Requirements

All major requirements and technical electives except CSE 197, 198, or 199 must be taken for a letter grade. To graduate, a grade-point average of 2.0 will be required in upper-division courses in the major, including technical electives. In addition, each student must satisfy general-education course requirements determined by the student's college, as well as major requirements determined by the department. The five colleges at UCSD require widely different numbers of general-education courses. Each student should choose his or her college carefully, considering the special nature of the college and breadth of education, realizing that some colleges require considerably more courses than others.

Five-year Bachelor's—Master's Program

Undergraduate students in the Department of Computer Science and Engineering who are enrolled in the B.S. or B.A. computer science or B.S. computer engineering degree programs, and who have a cumulative GPA of a 3.4 and also a GPA of 3.4 in at least seven core courses, are eligible to apply for the Five Year Bachelor's-Master's Degree Program. The deadline to apply is the fourth week of the fourth quarter before graduation. Acceptance into this program is an honor which carries with it practical benefits—the graduate application process is simplified (no GREs required), students accepted into this program can be admitted fall, winter, and spring quarter, based upon availability of openings in the program. Advanced students are given access to graduate level courses and have the opportunity to do graduate level research earlier under the direct supervision of UCSD's faculty, and students are able to complete the B.A., B.S., and M.S. degree within a five-year time period. Courses taken can be used toward either the B.A., B.S., or M.S. degree, but not counted toward both degrees. Additional information and applications can be obtained by contacting the CSE Student Affairs Office, APM 3402.

The Graduate Program

The graduate program offers master of science and doctor of philosophy degrees in computer science and computer engineering. To be accepted into either course of study, a student must have a B.A./B.S. degree in computer science, computer engineering, or a related area.

The graduate program is concerned with fundamental aspects of computation; emphasis is divided among the areas of theory, hardware, software systems, and artificial intelligence. The computer engineering specialization places a greater emphasis on hardware and the design of computer systems.

Admission to the graduate program is done through the Office of Graduate Admissions, Department of CSE. Deadline for application is January 3. Admissions are always effective the following fall quarter. For admission requirements, please refer to the departmental Web page: http://www-cse.ucsd.edu/graduate/

Admission decisions for the M.S. and Ph.D. programs are made separately. An M.S. student who wishes to enter the Ph.D. program must submit a new application to the CSE admissions committee.

Computer Science Program

Master of Science Program

The department offers the master of science degree in computer science. The degree can be pursued under either the Thesis Plan I or the Comprehensive Examination Plan II. Each plan requires forty-nine units of work. For full-time students, all the requirements must be completed within two years. Students with an adequate background in computer science can complete the M.S. program within four to five quarters of full-time study.

THESIS OR COMPREHENSIVE EXAM

There are two plans of study for the master's degree: Plan I, in which the student writes a thesis, and Plan II, in which the student takes a set of comprehensive exams.

Plan I: Thesis Option, No Comprehensive Exam

This plan involves both course work and research, culminating in the preparation of a thesis. The student must take twelve units of CSE 298 (Independent Study) to fulfill the research requirement, and a thesis based on research must be written and subsequently reviewed by the thesis committee. This committee, which is appointed by the dean of Graduate Studies and Research, consists of three faculty members, with at least two members from within the CSE department.

Plan II: Comprehensive Examination, No Thesis

Under this plan, the student must pass a written comprehensive examination designed to test the student's knowledge in basic computer science material. The examination can normally be passed with a thorough knowledge of topics covered in the undergraduate and first-year graduate computer science programs. It is offered every year in the first few weeks of the fall quarter and in the first few weeks of the spring quarter. Each student is allowed three attempts to pass the examination. The student must secure at least a master's-level pass in the written comprehensive examination. More information regarding the comprehensive examination can be found in a separate document provided by the CSE graduate office.

In particular, the written examination is structured around the three CSE core areas: algorithms and data structures; operating systems; and computer architecture and digital logic design.

Required Courses

Students entering the M.S. Program in Computer Science will choose an area of concentration from among fourteen areas. Each concentration is an area in which the faculty has significant research expertise.

The typical concentration is a collection of three courses which are designed to give the student in-depth training in the chosen field.

Additionally, to ensure breadth, all students are required to take four core courses.

Core courses must be completed with an average grade of B and no grade below B–. The four core courses required of all students are as follows:

CSE 202. Algorithms Design and Analysis
CSE 221. Operating Systems
CSE 240A. Principles of Computer Architecture
CSE 292. Faculty Research Seminar

The department expects to offer concentrations in the following areas:

Artificial Intelligence
Communication Networks
Computer Architecture and Compilers
Computer Graphics and Vision
Cryptography and Security
Databases
Design Automation for Microelectronic Designs
Distributed and Fault-Tolerant Computing
Embedded Systems and Software
Multimedia Systems
Parallel and Scientific Computing
Software Engineering
Storage Systems
Ph.D. Preparation

The specific courses involved in each of the concentrations are detailed in a separate bulletin which is available in the Graduate Student Affairs Office, 3402 AP&M.

Project

Students electing Plan II are required to execute a project while enrolled in four units of CSE 293.

Electives

In addition to completing the required core courses and fulfilling either the thesis or comprehensive examination requirements described above, the student must also complete additional approved courses to bring the total number of units to forty-nine. The number of units of electives depends upon whether the student chooses Plan I or Plan II. The electives consist of other CSE graduate courses or courses from a list of approved electives. Units obtained in the courses CSE 293, 298, 299, 500, 501, 599, and any of the seminar courses CSE 209, 229, 259, 269, 290, and 294 do not count toward the elective requirement.

Computer Engineering Program

Computer engineering, jointly administered between the CSE and ECE departments, offers the master of science and doctoral degrees with the degree title computer science and engineering (computer engineering). Computer engineering explores the engineering analysis and design aspects of algorithms and technology. Specific research areas include computer systems, signal processing systems, architecture, networks, computer-aided design, fault tolerance, and data storage systems.

Master of Science Program

The degree can be pursued under either the Thesis Plan I or the Comprehensive Examination Plan II. Each plan requires forty-nine units of work. For full-time students, all the requirements must be completed within two years. Students with an adequate background in computer engineering can complete the M.S. program within four to five quarters of full-time study.

PLAN I: THESIS OPTION, NO COMPREHENSIVE EXAM

This plan of study involves both course work and research, culminating in the preparation of a thesis. A total of forty-nine units of credit is required, as follows:

Core Courses

The following core courses must be completed with an average grade of B and no grade below B–:

Three Software Courses:
CSE 202
CSE 221
CSE 231

Three Hardware Courses:
CSE 240A
ECE 260A
CSE 243A or ECE 251A or ECE 263A

Two Analysis Courses:
CSE 200
CSE 222A or ECE 257A

and:
CSE 292

Electives

Students must elect at least four technical units among graduate courses within the Departments of AMES, CSE, ECE, Mathematics, and Physics.

Thesis

Twelve units of CSE 298 must be taken with a faculty member in CSE or ECE who agrees to act as adviser for the thesis to fulfill the research requirement.

A thesis based on research must be written and subsequently reviewed by a committee, consisting of three faculty members, with at least two members from within the CSE department. The committee is appointed by the dean of Graduate Studies.

PLAN II: COMPREHENSIVE EXAMINATION, NO THESIS

In order to receive the M.S. degree in computer engineering under this plan, a student must complete the course requirements listed below and pass a written comprehensive examination.

The written examination is structured around the following three CSE core areas: algorithms and data structures; operating systems; and computer architecture and digital logic design.

Core Courses

Three Software Courses:
CSE 202
CSE 221
CSE 231

Three Hardware Courses:
CSE 240A
ECE 260A
CSE 243A or ECE 251A or ECE 263A

Two Analysis Courses:
CSE 200
CSE 222A or CSE 257A

and
CSE 292

Electives

Students must elect at least twelve technical units among graduate courses within the Departments of MAE, CSE, ECE, Mathematics, and Physics.

Project

Four units of CSE 293.

Comprehensive Examination

The comprehensive examination is designed to test the student's knowledge in basic computer science and engineering material. The

examination can normally be passed with a thorough knowledge of topics covered in the undergraduate and the first-year graduate computer science or computer engineering programs.

It is offered every year in the first few weeks of the fall quarter and in the first few weeks of the spring quarter. If fewer than seven people sign up, then the department may cancel the examination in the spring quarter. Each student is allowed three attempts to pass the examination. The student must secure at least a master's-level pass in the written comprehensive examination.

This examination is the same for both the computer science and the computer engineering graduate programs. More information about the comprehensive examination can be obtained in a separate document from the CSE graduate office.

Doctoral Programs

Ph.D. Degree Programs in Computer Science and Computer Engineering

CSE offers doctor of philosophy degrees in computer science and in computer engineering, providing a research-oriented education in preparation for a research, industrial, or entrepreneurial career. These programs explore both the fundamental aspects and application of computation, spanning theory, software, hardware, and applications. Our particular areas of research expertise include:

- algorithms
- artificial intelligence
- bioinformatics
- complexity theory
- computer architecture/compilers
- VLSI/CAD and embedded systems
- databases and information management
- distributed systems and networking
- graphics and vision
- high performance computing
- mobile computing
- security and cryptography
- software engineering

COMPETENCY REQUIREMENT

We consider command of the materials covered in the following courses to be an adequate background for the Ph.D. program. The competency requirement is intended to ensure that Ph.D. students already have or acquire this undergraduate background. Students, who do not have this background at the time of entry, may be asked to either enroll in the following undergraduate class or to study it independently and demonstrate their knowledge by obtaining a B+ or better in the class or in the final exam.

CSE 101 (Algorithms)

CSE 105 (Theory of Computation)

CSE 120 (Principles of Computer Operating Systems)

Two of the following three courses:

CSE 130, 131A-B (Programming Languages/Compilers)

CSE 141 (Introduction to Computer Architecture)

CSE 221 (Operating Systems)

CSE 240A (Architecture)

CSE 200 (Complexity) for Computer Science

or CSE 241A (Introduction to Computing Circuitry) for Computer Engineering

CSE 292 (Faculty Research Seminar)

COURSE REQUIREMENTS

The course requirement is intended to ensure that students are exposed to fundamental concepts and tools (core requirement), a deep up-to-date view of their research area (depth requirement), and advanced, up-to-date view of the some topics outside their area (breadth requirement). Ph.D. students are expected to complete the core, depth, and breadth requirements in the first two years of the program. All required coursework must be taken for a letter grade except for CSE 291 (Topics in CSE), CSE 292 (Faculty Research Seminar), CSE 299 (Research), and CSE 500 or CSE 501 (Teaching Assistantship) for which only S/U grades are allowed.

Units obtained from a single course cannot count more than once towards satisfying the requirement in each of the core, depth, breadth, and elective areas. Ph.D. students who have taken similar courses elsewhere may petition for a waiver of the required courses or for substitution by alternative courses.

Core Requirements

The core requirements ensure that the Ph.D. students share knowledge of fundamental concepts and tools. Each Ph.D. student must take these courses for letter grade and maintain an overall core course GPA of 3.4 with no grade lower than a B- (except for CSE 292, for which a letter grade is not assigned). A student will typically complete all the core courses within the first year of graduate study, and must complete all core courses within two years of entry.

CSE 202 (Algorithms)

Depth Requirements

The depth requirement ensures that a Ph.D. student has, early on in his or her career, acquired some depth of knowledge in a general research area. Each Ph.D. student must select one of the following areas as his or her major area. The student must take three courses (12 units) from this major area. The student must take these courses for letter grade and maintain an overall depth course GPA of 3.4 with no grade lower than B- in these courses. One of these three courses can be Topics in CSE (CSE 291) or Independent Study (CSE 299), which are not taken for a letter grade. The department will maintain a list of appropriate courses for each major area.

The major areas are:

Theoretical Computer Science

Programming Languages, Compilers, and Software Engineering

Computer Systems

Database Systems

Computer Engineering

Artificial Intelligence

Breadth Requirements

Research in computer science and engineering is increasingly interdisciplinary, and acquiring a broader view of the field in general is important. Each Ph.D. student must take three courses (12 units) from at least two other areas different from the major area. Courses must be taken for letter grade and students must maintain an overall breadth course GPA of 3.0 with no grade lower than B- in these courses. Units obtained in CSE 209 series, 229 series, 239 series, 249 series, 259 series, 269 series, 279 series, 289 series, 290, 292, 293, 294, 298, 291, 299, 500, 501, and 599 do not count toward the breadth requirement.

Electives

In addition to the above required course work, each student is expected to take two additional courses (8 units). Students must obtain

no grade lower than C- in these courses. Undergraduate upper-division courses, CSE 291, and CSE 299 may fulfill this requirement. Units obtained in CSE 209 series, 229 series, 239 series, 249 series, 259 series, 269 series, 279 series, 289 series, 290, 292, 293, 294, 298, 500, 501, and 599 do not count toward the elective requirement.

RESEARCH EXAM REQUIREMENT

The research exam is intended to verify three components of the student's preparation for Ph.D. research: (1) breadth of comprehension sufficient to enable computer science research in areas beyond the topic(s) of the research exam and thesis; (2) ability to perform critical study, analysis, and writing in a focused area; and (3) research experience.

The research exam has both an oral part and a written part. The oral part of the research exam is distinct from, and cannot be combined with the University Qualifying Exam. Grading criteria for each part, and standards for passing, are available from the CSE department graduate office.

The research exam is conducted by a committee of three faculty members approved by the Graduate Committee and the chair of the department. At least two committee members must be CSE senate faculty, and the student's adviser must be a member of the committee. The normative time for passing the research exam is by the end of the second year of study; the exam must be passed by the end of the third year if the student is to continue in the Ph.D. program. Passing the research exam enables a Ph.D. student to receive the M.S. degree. Ph.D. students who do not pass the exam after two attempts will be given the opportunity to write a thesis in order to receive a terminal M.S. degree. The M.S. degree is only granted to those students who do not already hold an M.S. degree prior to entering the CSE department at UCSD.

TEACHING ASSISTANT REQUIREMENT

All students enrolled in the Ph.D. program must have one quarter of training as a teaching assistant. This is a formal degree requirement and must be completed before the student is permitted to graduate. The requirement is met by serving as a 50 percent teaching assistant and taking either CSE 500 or CSE 501(Teaching Assistantship).

QUALIFYING EXAMINATION AND ADVANCEMENT TO CANDIDACY

The qualifying examination is a requirement for advancement to candidacy. Prior to taking the qualifying examination a student must have satisfied the departmental competency, course, and research exam requirements and must have been accepted by a CSE faculty member as a Ph.D. thesis candidate. All doctoral students are expected to advance to candidacy by the end of their third year, and advancement is mandatory by the end of the fourth year. The examination is administered by a doctoral committee appointed by the dean of Graduate Studies and Research and consists of faculty from CSE and other departments. More information on the composition of the committee can be obtained from the CSE graduate office. The examination is taken after the student and his or her adviser have identified a topic for the dissertation and an initial demonstration of feasible progress has been made. The candidate is expected to describe his or her accomplishments to date as well as future work.

DISSERTATION

The dissertation defense is the final Ph.D. examination. A candidate for the Ph.D. is expected to write a dissertation and defend it in an oral examination conducted by the doctoral committee.

DEPARTMENTAL PH.D. TIME LIMIT POLICIES

Students must be advanced to candidacy by the end of four years. Total university support cannot exceed seven years. Total registered time at UCSD cannot exceed eight years.

FINANCIAL AID

Financial support is available to qualified graduate students in the form of fellowships, loans, and assistantships. Anticipated stipends for half-time research assistantships are $1573 per month, with the possibility of full-time employment during the summer months. For a half-time teaching assistantship, the anticipated stipend will be $1571 per month. Requests for application forms for admission and financial support should be directed to the Department of Computer Science and Engineering.

COURSES

Student demand exceeds capacity in many CSE courses. Accordingly, many CSE undergraduate courses may have enrollment restrictions which give priority to students in the following order:

- CSE majors, CSE M.S., and CSE Ph.D. students
- CSE pre-majors, ECE CE majors and pre-majors, and Math-CS majors
- students fulfilling a non-elective requirement in another program
- CSE minors
- all other majors or pre-majors in other SOE departments
- all others, with permission of the Department of Computer Science and Engineering

Where these restrictions apply, the registrar will not enroll low-priority students in the course.

A tentative schedule of course offerings is available from the department, APM 3402, each spring for the following academic year. The tentative schedule for 2002–2003 is also found at http://www-cse.ucsd.edu/ugrad/offerings02-03.html.

LOWER-DIVISION

CSE 3. Fluency in Information Technology (4)
Introduces the concepts and skills necessary to effectively use information technology. Includes basic concepts and some practical skills with computer and networks. *Prerequisite: none.*

CSE 5A. Introduction to Programming I (4)
(Formerly CSE 62A) Introduction to algorithms and top-down problem solving. Introduction to the C language including functions, arrays, and standard libraries. Basic skills for using a PC graphical user interface operating system environment. File maintenance utilities are covered. (A student may not receive credit for CSE 5A after receiving credit for CSE 10 or CSE 11 or CSE 8B or CSE 9B or CSE 62B or CSE 65.) *Prerequisite: A familiarity with high-school level algebra is expected, but this course assumes no prior programming knowledge.*

CSE 8A. Introduction to Computer Science: Java (4)
Basic UNIX. Basics of Java language. Classes, methods, and parameters. Modularity and abstraction. Documentation techniques. Testing and verification techniques. Basic Inheritance. Event driven programming. Programming with AWT library or other similar library. CSE 8A-B is a slower paced version of CSE 11 with more programming practice. (Students who have taken CSE 9A or CSE 9B or CSE 10 or CSE 11 may not take CSE 8A.) *Prerequisite: high school algebra.* Majors only.

CSE 8B. Introduction to Computer Science: Java (4)
Continuation of the Java language. Continuation of programming techniques. More on Inheritance. Exception handling. CSE 8A-B is a slower paced version of CSE 11 with more programming practice. (Students who have taken CSE 9A or CSE 9B or CSE 10 or CSE 11 may not take CSE 8B.) *Prerequisite: high school algebra.* Majors only.

CSE 11. Introduction to Computer Science and Object-Oriented Programming: Java (4)
Introduction to computer science and programming using the Java language. Basic UNIX. Modularity and

abstraction. Documentation, testing and verification techniques. Basic object-oriented programming including inheritance and dynamic bind. Exception handling. Event-driven programming. Experience with AWT library or other similar library. *Prerequisites: high-school algebra and a course in programming in a compiled language.* Majors only.

CSE 12. Basic Data Structures and Object-Oriented Design (4)
Basic data structures including stacks, queues, lists, binary trees, hash tables. Basic object-oriented design including encapsulation, polymorphism, classes as the implementation of abstract data types. Memory management, pointers, recursion, and big-o notation. Uses the C/C++ and Java programming language. *Prerequisite: CSE 8B or CSE 11.*

CSE 20. Introduction to Discrete Mathematics (4)
Basic discrete mathematical structure: sets, relations, functions, sequences, equivalence relations, partial orders, and number systems. Methods of reasoning and proofs: propositional logic, predicate logic, induction, recursion, and pigeonhole principle. Infinite sets and diagonalization. Basic counting techniques; permutation and combinations. Applications will be given to digital logic design, elementary number theory, design of programs, and proofs of program correctness. Credit not offered for both Math. 15A and CSE 20. Equivalent to Math 15A. *Prerequisites: CSE 8A or CSE 8B or CSE 11. CSE 8B or CSE 11 may be taken concurrently with CSE 20/ Math. 15A.*

CSE 21. Mathematics for Algorithms and Systems (4)
This course will provide an introduction to the discrete mathematical tools needed to analyze algorithms and systems. Enumerative combinatorics: basic counting principles, inclusion-exclusion, and generating functions. Matrix notation. Applied discrete probability. Finite automata. Credit not offered for both Math.15B and CSE 21. Equivalent to Math 15B. *Prerequisites: CSE 20 or Math. 15A.*

CSE 30. Computer Organization and Systems Programming (4)
(Formerly CSE 70.) Introduction to organization of modern digital computers—understanding the various components of a computer and their interrelationships. Study of a specific architecture/machine with emphasis on systems programming in C and Assembly languages in a UNIX environment. *Prerequisites: CSE 12 and CSE 20 or Math. 15A; or consent of the instructor.*

CSE 80. UNIX Lab (2)
The objective of the course is to help the programmers create a productive UNIX environment. Topics include customizing the shell, file system, shell programming, process management, and UNIX tools. (P/NP grades only.) *Prerequisite: CSE 8B or CSE 9B or CSE 10 or CSE 11.*

CSE 87. Freshman Seminar (1)
The Freshman Seminar Program is designed to provide new students with the opportunity to explore an intellectual topic with a faculty member in a small seminar setting. Freshman seminars are offered in all campus departments and undergraduate colleges, and topics vary from quarter to quarter. Enrollment is limited to 15 to 20 students, with preference given to entering freshmen. *Prerequisite: none.*

CSE 99. Independent Study in Computer Science and Engineering (4)
Independent reading or research by special arrangement with a faculty member. *Prerequisites: lower-division standing. Completion of 30 units at UCSD with a UCSD GPA of 3.0. Special Studies form required. Department stamp required. Consent of instructor and approval of the department. Majors only.*

UPPER-DIVISION

CSE 100. Advanced Data Structures (4)
Descriptive and analytical presentation of data structures and algorithms. Lists, tables, priority queues, disjoint subsets, and dictionaries data types. Data structuring techniques include linked lists, arrays, hashing, and trees. Performance evaluation involving worst case, average and expected case, and amortized analysis. Credit not offered for both Math. 176 and CSE 100. Equivalent to Math. 176. *Prerequisites: CSE 12, CSE 21 or Math. 15B, and CSE 30, or consent of the instructor.* Majors only.

CSE 101. Design and Analysis of Algorithms (4)
Design and analysis of efficient algorithms with emphasis on non-numerical algorithms such as sorting, searching, pattern matching, and graph and network algorithms. Measuring complexity of algorithms, time and storage. NP-complete problems. Credit not offered for both Math. 188 and CSE 101. Equivalent to Math 188. *Prerequisites: CSE 12, CSE 21 or Math. 15B or Math. 100A or Math. 103A and CSE 100 or Math. 176.* Majors only.

CSE 102. Storage System Architectures (4)
Descriptive and analytic introduction to disk drive storage media, external data structures, and their algorithms. Disk drives, external sorting, index structures, disk arrays, reliability, data declustering, and video servers. Merge sort, B+trees, linear hashing, improved RAID data organizations, and SID data layout. *Prerequisite: CSE 100 or Math. 176, CSE 120, CSE 123A, or consent of the instructor.* Majors only.

CSE 105. Theory of Computability (4)
An introduction to the mathematical theory of computability. Formal languages. Finite automata and regular expression. Push-down automata and context-free languages. Computable or recursive functions: Turing machines, the halting problem. Undecidability. Credit not offered for both Math. 166 and CSE 105. Equivalent to Math 166. *Prerequisites: CSE 12, CSE 21 or Math. 15B or Math. 100A or Math. 103A.* Majors only.

CSE 107. Introduction to Modern Cryptography (4)
Topics include private and public-key cryptography, block ciphers, data encryption, authentication, key distribution and certification, pseudorandom number generators, design and analysis of protocols, zero-knowledge proofs, and advanced protocols. Emphasizes rigorous mathematical approach including formal definitions of security goals and proofs of protocol security. *Prerequisites: CSE 21 or Math. 15B, CSE 101 or Math. 188, CSE 105 or Math. 166.* Majors only.

CSE 111. Object Oriented Software Design (4)
Introduction to object-oriented analysis and design. Object-oriented modeling methods for analysis and design, object-oriented general design paradigms, object-oriented design techniques. Cyclic development of object-oriented systems. *Prerequisites: CSE 8B or CSE 9B or CSE 10 or CSE 11, CSE 12, and CSE 100 or Math. 176.* Majors only.

CSE 112. Software Engineering (4)
(Formerly CSE 110.) This course will cover software engineering topics associated with large systems development such as requirements and specifications, testing and maintenance, and design. *Prerequisites: CSE 111.* Majors only.

CSE 118. Ubiquitous Computing (4)
Explores emerging opportunities enabled by cheap sensors and networked computing devices, and is organized as a preparatory course for graduate school. Students read, present, and discuss research papers. Small research projects will be conducted in teams, culminating in project presentations at the end of the term. The weekly discussion section will cover material relevant to the project on research methods, software engineering, teamwork, and project management. *Prerequisites: successful completion of a major project course, including: CSE 131B, CSE 132B, Cog Sci 102C, Cog Sci 121, Cog Sci 184, ECE 111, ECE 118, ECE 191, ECE 192, COMT 111B, COMT 115, or ICAM 160B. Other project courses, experience, or accomplishments may be petitioned. Majors only.*

CSE 120. Principles of Computer Operating Systems (4)
(Formerly CSE 171A.) This course introduces the basic concepts used to structure computer operating systems. Examples of notions introduced and discussed are batch processing, multiprogramming, input/output, pooling, interrupt handling, processes, descriptors, process synchronization, interprocess communication, memory management, virtual memory, caching, buffers, naming, files, interactive command interpre-ters, and processor scheduling. *Prerequisites: CSE 100 or Math. 176, CSE 101 or Math. 188, and CSE 141.* Majors only.

CSE 121. Operating Systems: Architecture and Implementation (4)
(Formerly CSE 171B.) Case study of architecture and implementation of a selected modern operating system. In-depth analysis through a detailed study of source code. Topics include process creation, context-switching, memory allocation, synchronization mechanisms, interprocess communication, I/O buffering, device drivers, and file systems. *Prerequisite: CSE 120.*

CSE 123A. Computer Networks (4)
Introduction to concepts, principles, and practice of computer communication networks with examples from existing architectures, protocols, and standards with special emphasis on the Internet protocols. Layering and the OSI model; physical and data link layers; local and wide area networks; datagrams and virtual circuits; routing and congestion control; internetworking. Transport protocols. *Prerequisite: CSE 141.* Majors only.

CSE 123B. Communications Software (4)
Protocol software structuring, The Internet protocol suite, Inter-process communication, Protocols for real-time and multimedia (digital audio and video) communication, multicast, bridging, and group communication protocols, protocols for mobile and personal communication networks, application-level protocols, secure communication. *Prerequisite: CSE 120 or consent of the instructor. CSE 123A is strongly recommended.* Majors only.

CSE 125. Software System Design and Implementation (4)
Design and implementation of large, complex software systems involving multiple aspects of CSE curriculum. Emphasis is on software system design

applied to a single, large group project with close interaction with instructor. *Prerequisites: senior standing with substantial programming experience, and consent of instructor.* Majors only.

CSE 126. Multimedia Systems (4)
Multimedia technologies; multimedia storage models and structures; data models and interfaces; multimedia information systems; video/audio networking; media synchronization; image computing and information assimilation; conferencing paradigms and structured interaction support. *Prerequisite: CSE 120 or consent of the instructor.*

CSE 127. Introduction to Computer Security (4)
Topics include basic cryptography, security/threat analysis, access control, auditing, security models, distributed systems security, and theory behind common attack and defense techniques. The class will go over formal models as well as the bits and bytes of security exploits. *Prerequisite: CSE 21 or Math. 15B, and CSE 120.* Majors only.

CSE 128. Concurrency (4)
Specification of concurrent programs safety, liveness, and fairness: producer-consumer; mutual exclusion; atomic read/writes; semaphores; monitors; distributed algorithms and memory coherency; programming with threads; concurrency in popular programming languages and operating systems. *Prerequisite: CSE 120.* Majors only.

CSE 130. Programming Languages: Principles and Paradigms (4)
(Formerly CSE 173.) Introduction to programming languages and paradigms, the components that comprise them, and the principles of language design, all through the analysis and comparison of a variety of languages (e.g., Pascal, Ada, C++, PROLOG, ML.) Will involve programming in most languages studied. *Prerequisites: CSE 12 and CSE 100 or Math. 176.* Majors only.

CSE 131A. Compiler Construction I (4)
(Formerly CSE 163A.) Introduction to the compilation of programming languages, principles and practice of lexical and syntactic analysis, error analysis, syntax-directed translation, and type checking. *Prerequisites: CSE 30, CSE 100 or Math. 176, and CSE 105 or Math. 166.* Majors only.

CSE 131B. Compiler Construction II (4)
(Formerly CSE 163B.) Principles and practice for the design and implementation for the back-end of translators for programming languages, symbol tables, syntax-directed translation, code generation, optimization, and compiler structure. *Prerequisites: CSE 30, CSE 100 or Math. 176, CSE 105 or Math. 166, and CSE 131A.* Majors only.

CSE 132A. Database System Principles (4)
Basic concepts of databases, including data modeling, relational databases, query languages, optimization, dependencies, schema design, and concurrency control. Exposure to one or several commercial database systems. Advanced topics such as deductive and object-oriented databases, time allowing. *Prerequisite: CSE 100 or Math. 176.* Majors only.

CSE 132B. Database Systems Applications (4)
Design of databases, transactions, use of trigger facilities and datablades. Performance measuring, organization of index structures. *Prerequisite: CSE 132 or CSE 132A or equivalent.*

CSE 133. Information Retrieval (4)
(Formerly CSE 181.) How to find "relevant" documents (e.g., an electronic mail message or a book) from very large corpora (e.g., all the world's electronic mail or the library.) Students will construct and experimentally evaluate a complete IR system for a modest textual corpus. *Prerequisite: CSE 100 or Math. 176.* Majors only.

CSE 134A. Web Server Languages (4)
Design and implementation of interactive World Wide Web documentation using server-side programs. Languages covered include HTML, Perl, and JavaScript. Other languages as time allows. *Prerequisite: CSE 100 or Math. 176.* Majors only.

CSE 134B. Web Client Languages (4)
Design and implementation of interactive World Wide Web clients using helper applications and plug-ins. The main language covered will be Java. *Prerequisite: CSE 100 or Math. 176.* Majors only.

CSE 135. Server-side Web Applications (4)
Design and implementation of dynamic web-based applications. Multi-tier architecture, scripting languages, SQL, XML, session handling, non-browser clients, Web services, and scalability, security, and usability in the Web context. *Prerequisites: CSE 100 or Math. 176.* Majors only.

CSE 136. Enterprise-class Web Applications (4)
Design and implementation of large scale web-based applications. Modeling organizational needs, design and revision management, J2EE or similar software platforms, Web and application server functionality, reuse of object-oriented components, model-view-controller and other design patterns, clustering, load-balancing, fault-tolerance, authentication, usage accounting. *Prerequisite: CSE 135.* Majors only.

CSE 140. Components and Design Techniques for Digital Systems (4)
(Formerly CSE 170A) Design of Boolean logic and finite state machines; two-level, multi-level combinational logic design, combinational modules and modular networks, Mealy and Moore machines, analysis and synthesis of canonical forms, sequential modules. *Prerequisites: CSE 20 or Math. 15A, CSE 30. CSE 140L must be taken concurrently.* Majors only.

CSE 140L. Digital Systems Laboratory (2)
(Formerly CSE 175B) Implementation with computer-aided design tools for combinational logic minimization and state machine synthesis. Hardware construction of a small digital system. *Prerequisites: CSE 20, CSE 30. CSE 140 must be taken concurrently.*

CSE 141. Introduction to Computer Architecture (4)
Introduction to computer architecture. Computer system design. Processor design. Control design. Memory systems. *Prerequisites: CSE 140, CSE 140L, or consent of the instructor. CSE 141L should be taken concurrently.* Majors only.

CSE 141L. Project in Computer Architecture (2)
Hands-on computer architecture project aiming to familiarize students with instruction set architecture, and design of process. Control and memory systems. *Prerequisites: CSE 140, CSE 140L, or consent of the instructor. CSE 141 should be taken concurrently.* Majors only.

CSE 142. Advanced Digital Logic Design (4)
(Formerly CSE 170C) Digital logic optimization; functional decomposition and symmetric functions; reliable design and fault diagnosis; structure of sequential machines; asynchronous circuit design. Assignments using logic synthesis tools. *Prerequisites: CSE 140, CSE 140L*

CSE 144. Computer-Aided Design of VLSI Circuits (4)
(Formerly CSE 172B) Introduction to Computer-Aided Design. Placement, assignment and floor planning techniques. Routing. Symbolic layout and compaction. Module generation and silicon compilation. *Prerequisites: CSE 140 and CSE 140L, or consent of the instructor.*

CSE 150. Programming Languages for Artificial Intelligence (4)
Note: CSE 150 is pending CEP approval. (Formerly CSE 162) Experience using two very different approaches to artificial intelligence programming. Symbolic manipulation using LISP, with examples drawn from heuristic search, inference, and/or resolution theorem proving. Pattern recognition and transformation using neural networks with perception and back propagation learning algorithms, applied to problems such as face recognition, English past tense formation, etc. *Prerequisites: CSE 8B or CSE 9B or CSE 10 or CSE 11, CSE 12, and CSE 100 or Math. 176.* Majors only.

CSE 151. Introduction to Artificial Intelligence (4)
An introduction to theoretical issues and computational techniques arising from a comparison of human and machine intelligences. Knowledge representation languages; problem-solving heuristics; machine learning and application areas including vision, robotics, and natural language understanding will be reviewed. *Prerequisite: CSE 150 or consent of the instructor.* Majors only.

CSE 152. Introduction to Computer Vision (4)
The goal of computer vision is to compute scene and object properties from images and video. This introductory course includes feature detection, image segmentation, motion estimation, object recognition, and 3-D shape reconstruction through stereo, photometric stereo, and structure from motion. *Prerequisites: Math. 20F, CSE 100 or Math. 176, CSE 101 or Math. 188. Knowledge of C, C++ or Matlab programming.* Majors only.

CSE 160. Introduction to High Performance Parallel Computation (4)
Introduction to HPPC: parallel architecture, algorithms, software and problem-solving techniques. Areas covered: Flynn's taxonomy, processor-memory organizations, shared and non-shared memory models; message passing and multithreading, data parallelism; speedup, efficiency, and Amdahl's law, communication and synchronization, isoefficiency, and scalability. Topics: run time software techniques, compilers, and grid computing. Assignments given to provide practical experience. *Prerequisite: CSE 100 or Math. 176.* Majors only.

CSE 166. Image Processing (4)
Principles of image formation, analysis, and representation. Image enhancement, restoration, and segmentation; stochastic image models. Filter design, sampling, Fourier and wavelet transforms. Selected applications in computer graphics and machine vision. *Prerequisites: Math. 20F, CSE 100 or Math. 176.* Majors only.

CSE 167. Computer Graphics (4)
(Formerly CSE 177) Representation and manipulation of pictorial data. Two-dimensional and three-dimensional transformations, curves, surfaces. Projection, illumination, and shading models. Raster and vector graphic I/O devices; retained-mode and immediate-

mode graphics software systems and applications. *Prerequisites: Math. 2EA/20F and CSE 100 or Math. 176.* Majors only.

CSE 168. Computer Graphics II: Rendering (4)
Weekly programming assignments that will cover graphics rendering algorithms. During the course the students will learn about ray tracing, geometry, tessellation, acceleration structures, sampling, filtering, shading models, and advanced topics such as global illumination and programmable graphics hardware. *Prerequisites: CSE 167 or concurrent enrollment.* Majors only.

CSE 169. Computer Animation (4)
Advanced graphics focusing on the programming techniques involved in computer animation. Algorithms and approaches for both character animation and physically based animation. Particular subjects may include skeletons, skinning, key framing, facial animation, inverse kinematics, locomotion, motion capture, video game animation, particle systems, rigid bodies, clothing, and hair. *Prerequisites: a good understanding of linear algebra. CSE 167 or consent of instructor.* Majors only.

CSE 171. User Interface Design (4)
Explores usability, representation and coordination issues in user interface design with some focus on distributed cooperative work, semiotics, and the interplay between socio-cognitive and technical issues. Most examples and homework involve the Web. *Prerequisites: CSE 8B or 11, CSE 20 or Math. 15A, and CSE 100 or Math. 176.* Majors only.

CSE 175. Social and Ethical Issues in Information Technology (4)
Social aspects of information technology, with an emphasis on ethical issues. Topics include ethical theories, privacy and security, spam, e-commerce, the digital divide, open source software, medical informatics, actor-network theory, and some neo-classical economics. *Prerequisites: CSE 100 or Math. 176.* Majors only.

CSE 181. Molecular Sequence Analysis (4)
This course covers the analysis of nucleic acid and protein sequences, with an emphasis on the application of algorithms to biological problems. Topics include sequence alignments, database searching, comparative genomics, and phylogenetic and clustering analyses. Pairwise alignment, multiple alignment, DNS sequencing, scoring functions, fast database search, comparative genomics, clustering, phylogenetic trees, gene finding/DNA statistics. *Prerequisites: CSE 100 or Math. 176, CSE 101 or Math. 188, BIMM 100 or Chem. 114D.* Bioinformatics majors only. CSE 181 is crosslisted with BIMM 181 and BENG 181.

CSE 182. Biological Databases (4)
This course provides an introduction to the features of biological data, how that data are organized efficiently in databases, and how existing data resources can be utilized to solve a variety of biological problems. Relational databases, object oriented databases, ontologies, data modeling and description, survey of current biological database with respect to above, implementation of a database focused on a biological topic. *Prerequisites: CSE 100 or Math. 176.* Bioinformatics majors only. CSE 182 is crosslisted with BIMM 182, Chem 182, and BENG 182.

CSE 184. Computational Molecular Biology (4)
This advanced course covers the application of machine learning and modeling techniques to biological systems. Topics include gene structure, recognition of DNA and protein sequence patterns, classification, and protein structure prediction. Pattern discovery, hidden markov models/support vector machines/neural network/profiles, protein structure prediction, functional characterization of proteins, functional genomics/proteomics, metabolic pathways/gene networks. *Prerequisites: BIMM 181 or BENG 181 or CSE 181, BIMM 182 or BENG 182 or CSE 182.* Bioinformatics majors only. CSE 184 is crosslisted with BIMM 184 and BENG 184.

CSE 190. Topics in CSE (4)
Topics of special interest in computer science and engineering. Topics may vary from quarter to quarter. May be repeated for credit with the consent of instructor and department stamp required. *Prerequisite: department stamp required.*

CSE 191. Seminar in CSE (1–4)
A seminar course on topics of current interest. Students, as well as, the instructor will be actively involved in running the course/class. This course cannot be counted toward a technical elective. *Prerequisites: consent of instructor. Department stamp required.* Majors only.

CSE 195. Teaching (4)
Teaching and tutorial assistance in a CSE course under the supervision of the instructor. (P/NP grades only.) *Prerequisite: consent of the department chair. Department stamp required.*

CSE 197. Field Study in Computer Science and Engineering (4, 8, 12, or 16)
Directed study and research at laboratories away from the campus. (P/NP grades only.) *Prerequisite: consent of the instructor and approval of the department. Department stamp required.*

CSE 198. Directed Group Study (2 or 4)
Computer science and engineering topics whose study involves reading and discussion by a small group of students under the supervision of a faculty member. (P/NP grades only.) *Prerequisite: consent of the instructor. Department stamp required.*

CSE 199. Independent Study for Undergraduates (2 or 4)
Independent reading or research by special arrangement with a faculty member. (P/NP grades only.) *Prerequisite: consent of the instructor. Department stamp required.*

GRADUATE

CSE 200. Computability and Complexity (4)
Computability review, including halting problem, decidable sets, r.e. sets, many-one reductions; TIME(t(n)), SPACE(s(n)) and general relations between these classes; L, P, PSPACE, NP; NP—completeness; hierarchy theorems; RP, BPP. *Prerequisite: CSE 105 or equivalent.*

CSE 201A. Advanced Complexity (4)
Polynomial-time hierarchy (PH); BPP in second level of PH; Savitch's theorem; NL=coNL; non-uniform and circuit complexity; some circuit lower bounds; IP=PSPACE; probabilistic proof checking (PCP); Application of PCP to approximation hardness; Complexity of proof systems; Parallel complexity classes NC and AC; P-completeness. *Prerequisite: CSE 200.*

CSE 202. Algorithm Design and Analysis (4)
The basic techniques for the design and analysis of algorithms. Divide-and-conquer, dynamic programming, data structures, graph search, algebraic problems, randomized algorithms, lower bounds, probabilistic analysis, parallel algorithms. *Prerequisite: CSE 101 or equivalent.*

CSE 203A. Advanced Algorithms (4)
Modern advances in design and analysis of algorithms. Exact syllabus varies. Topics include approximation, randomized algorithms, probabilistic analysis, heuristics, online algorithms, competitive analysis, models of memory hierarchy, parallel algorithms, number-theoretic algorithms, cryptanalysis, computational geometry, computational biology, network algorithms, VLSI CAD algorithms. *Prerequisite: CSE 202.*

CSE 204A. Combinatorial Optimization (4)
Linear programming, simplex method, duality, and column generating technique. Integer programming introduced via the Knapsack problem. The periodic nature of all integer programs. Why the round-off technique cannot work in general. The solution of the Knapsack problem in polonominal time since nonbasic columns form a group. *Prerequisites: CSE 202 or Linear Algebra or consent of instructor.*

CSE 205A. Logic in Computer Science (4)
(Formerly CSE 208D) Mathematical logic as a tool in computer science. Propositional logic, resolution, first-order logic, completeness and incompleteness theorems with computational viewpoint, finite model theory, descriptive complexity, logic programming, nonmonotonic reasoning, temporal logic. Applications to databases, automatic theorem proving, program verification, and distributed systems. *Prerequisite: CSE 200 or consent of instructor.*

CSE 206A. Lattice Algorithms and Applications (4)
(Formerly CSE 207C) Introduction to the algorithmic theory of point lattices (A.K.A. algorithmic geometry of numbers), and some of its most important applications in cryptography and cryptanalysis. Topics usually include: LLL basis reduction algorithm, cryptanalysis of broadcast RSA, hardness of approximating lattice problems. *Prerequisites: CSE 202, CSE 200, or concurrent.*

CSE 206B. Algorithms in Computational Biology (4)
(Formerly CSE 257B) The course focuses on algorithmic aspects of modern bioinformatics and covers the following topics: computational gene hunting, sequencing, DNA arrays, sequence comparison, pattern discovery in DNA, genome rearrangements, molecular evolution, computational proteomics, and others. *Prerequisite: CSE 202 or consent of instructor.*

CSE 207. Modern Cryptography (4)
Private and public key cryptography, introduction to reduction based proofs of security, concrete security, block ciphers, pseudorandom functions and generators, symmetric encryption, asymmetric encryption, computational number theory, RSA and discrete log systems, message authentication, digital signatures, key distribution and key management. *Prerequisites: CSE 202 or consent of instgructor.*

CSE 207C. Lattices and Cryptology (4)
Renumbered to CSE 206A (see above).

CSE 208. Advanced Cryptography (4)
Zero-knowledge, secure computation, session-key distribution, protocols, electronic payment, one-way functions, trapdoor permutations, pseudorandom bit generators, hardcore bits. *Prerequisites: CSE 202, CSE 200, and CSE 207 or consent of instructor.*

CSE 208D. Logic in Computer Science (4)
Renumbered to CSE 205A (see above).

CSE 209A. Topics/Seminar in Algorithms, Complexity, and Logic (1-4)
Topics of special interest in algorithms, complexity, and logic to be presented by faculty and students under faculty direction. Topics vary from quarter to quarter. May be repeated for credit. *Prerequisites: consent of instructor.*

CSE 209B. Topics/Seminar in Cryptography (1-4)
Topics of special interest in cryptography to be presented by faculty and students under faculty direction. Topics vary from quarter to quarter. May be repeated for credit. *Prerequisite: consent of instructor.*

CSE 210. Principles of Software Engineering (4)
(Formerly CSE 264A.) General principles in modern software engineering. Both theoretical and practical topics are covered. Theoretical topics include proofs of correctness, programming language semantics, and theory of testing. Practical topics include structured programming, modularization techniques, design of languages for reliable programming, and software tools. *Prerequisites: CSE 100, 131A, 120, or consent of instructor.*

CSE 211. Software Testing and Analysis (4)
Survey of testing and analysis methods. Introduction to advanced topics in area as well as traditional production methods. Topics include inspections and reviews, formal analysis, verification and validation standards, non-statistical testing, statistical-testing and reliability models, coverage methods, testing and analysis tools, and organization management and planning. Methods special to special development approaches such as object-oriented testing will also be described. *Prerequisite: undergraduate major in computer science or extensive industrial experience.*

CSE 218. Advanced Topics in Software Engineering (4)
This course will cover a current topic in software engineering in depth. Topics in the past have included software tools, impacts of programming language design, and software system structure. (S/U grades permitted.) *Prerequisite: none.*

CSE 221. Operating Systems (4)
Operating system structures, concurrent computation models, scheduling, synchronization mechanisms, address spaces, memory management protection and security, buffering, streams, data-copying reduction techniques, file systems, naming, caching, disk organization, mapped files, remote file systems, case studies of major operating systems. *Prerequisites: CSE 120 and 121, or consent of instructor.*

CSE 222. Communication Networks (4)
Renumbered to CSE 222A (see below).

CSE 222A. Computer Communication Networks (4)
(Formerly CSE 222.) Computer communication network concepts, protocols, and architectures, with an emphasis on an analysis of algorithms, protocols, and design methodologies. Topics will include layering, error control, flow control, congestion control, switching and routing, quality of service management, mobility, naming, security, and selected contemporary topics. *Prerequisite: CSE 123A or consent of instructor.*

CSE 222B. Internet Algorithmics (4)
(Formerly CSE 228H.) Techniques for speeding up Internet implementations including system restructuring, new algorithms, and hardware innovations. Topics include: models for protocols, systems and hardware; efficiency principles; applying these principles to deriving techniques for efficient implementation of common endnode and router functions. *Prerequisites: CSE 123A or CSE 222A or consent of instructor.*

CSE 223. Distributed Systems (4)
Renumbered to CSE 223A (see below).

CSE 223A. Principles of Distributed Computing (4)
(Formerly CSE 223) Logical and physical time, snapshot protocols, failure models, replication strategies, consensus and reliable broadcast, self-stabilization, atomic commit. *Prerequisites: CSE 221 or consent of instructor.*

CSE 223B. Distributed Computing and Systems (4)
Efficient primitives for distributed operating systems and high-performance network servers, including concurrent and event-driven server architectures, remote procedure calls, and load shedding. Distributed naming, directory, and storage services, replication for fault tolerance, and security in distributed systems. *Prerequisites: CSE 221, CSE 222A, or consent of instructor.*

CSE 225. High Performance Distributed Computing (and Computational Grids) (4)
Architecture of high performance distributed systems (e.g., frameworks and middleware). High performance distributed objects (DCOM, Corba, Java Beans) and networking with crosscut issues for performance, availability, and performance predictability. Scalable servers, metacomputing, and scientific computing. *Prerequisites: CSE 121 and CSE 123A or consent of instructor.*

CSE 226. Storage Systems (4)
(Formerly CSE 228B.) Secondary and tertiary storage systems, optical and magnetic media, performance analysis, modeling, reliability, redundant arrays of inexpensive disks, striping, log and maximum distance separable data organizations, sparing. *Prerequisite: CSE 221 or consent of instructor.*

CSE 227. Computer Security (4)
Security and threat models, risk analysis, authentication and authorization, auditing, operating systems security, access control mechanisms, protection mechanisms, distributed systems/network security, security architecture, electronic commerce security mechanisms, security evaluation. *Prerequisite: CSE 221 or consent of instructor.*

CSE 228. Multimedia Systems (4)
(Formerly 228F) Emerging multimedia technologies; multimedia storage models and structures; video/audio networking; intra-media continuity; inter-media synchronization; admission control and support for real time; distributed multimedia systems; structured interaction support (collaboration and teamwork); multimedia encoding. *Prerequisite: consent of instructor.*

CSE 228B. Storage Systems (4)
Renumbered to CSE 226 (see above).

CSE 228F. Multimedia Systems (4)
Renumbered to CSE 228 (see above).

CSE 228H. Internet Algorithmics (4)
Renumbered to CSE 222B (see above).

CSE 229A. Topics/Seminar in Computer Systems (1-4)
Discussion on problems of current research interest in computer systems. Possible areas of focus include: distributed computing, computational grid, operating systems, fault-tolerant computing, storage systems, system services for the World Wide Web. Topics to be presented by faculty and students under faculty direction. Topics vary from quarter to quarter. May be repeated for credit. *Prerequisite: consent of instructor.*

CSE 229B. Topics/Seminar in Networks and Communication (1-4)
Discussion on problems of current research interest in computer networks and communication. Possible areas of focus include: wide-area networking, wireless networks, the Internet, computational grid, operating systems, fault-tolerant computing, storage systems. Topics to be presented by faculty and students under faculty direction. Topics vary from quarter to quarter. May be repeated for credit. *Prerequisite: consent of instructor.*

CSE 229C. Topics/Seminar in Computer Security (1-4)
Discussion on problems of current research interest in computer security. Topics to be presented by faculty and students under faculty direction. Topics vary from quarter to quarter. May be repeated for credit. *Prerequisite: consent of instructor.*

CSE 230. Principles of Programming Languages (4)
(Formerly CSE 273.) Functional versus imperative programming. Type systems and polymorphism; the ML language. Higher order functions, lazy evaluation. Abstract versus concrete syntax, structural and well-founded induction. The lambda calculus, reduction strategies, combinators. Denotational semantics, elementary domain theory. *Prerequisite: CSE 130 or equivalent, or consent of instructor.*

CSE 231. Advanced Compiler Design (4)
(Formerly CSE 264C.) Advanced material in programming languages and translator systems. Topics include compilers, code optimization, and debugging interpreters. *Prerequisites: CSE 100, 131A-B, or consent of instructor.*

CSE 232. Principles of Database Systems (4)
(Formerly CSE 264D.) Database models including relational, hierarchic, and network approaches. Implementation of databases including query languages and system architectures. *Prerequisite: CSE 100 or consent of instructor.*

CSE 232B. Database System Implementation (4)
A hands-on approach to the principles of databases implementation. Algebraic rewriters/optimizers, query processors, triggers. Beyond centralized relational databases. *Prerequisites: CSE 232.*

CSE 233. Database Theory (4)
Theory of databases. Theory of query languages, dependency theory, deductive databases, incomplete information, complex objects, object-oriented databases, and more. Connections to logic and complexity theory including finite model theory and descriptive complexity. *Prerequisite: CSE 200.*

CSE 237A. Introduction to Embedded Computing (4)
Embedded system technologies including processors, DSP, memory, and software. System interfacing basics, communication strategies, sensors, and actuators. Mobile and wireless technology in embedded systems. Using pre-designed hardware and software components. Design case studies in wireless, multimedia, and/or networking domains. *Prerequisites: basic courses in digital hardware, algorithms and data structures, elementary calculus, and probability; or consent of instructor.*

CSE 237B. Software for Embedded Systems (4)
Embedded computing elements, device interfaces, time-critical IO handling. Embedded software design under size, performance, and reliability constraints. Software timing and functional validation. Programming methods and compilation for embeddable software. Embedded runtime systems. Case studies of real-time software systems. *Prerequisites: CSE 237A; or basic courses in programming, algorithms and data structures, elementary calculus, discrete math, computer architecture; or consent of instructor.*

CSE 237C. Validation and Testing of Embedded Systems (4)
Embedded system building blocks including IP cores. Co-simulation. Formal verification using mdel checking. Verification environments. Test challenges in core integration: compliance, feature, random, and collision testing. Core access and test integration. Interface-based verification and standards. *Prerequisites: CSE 237A; or basic courses in algorithms and data structures, elementary calculus, discrete math, symbolic logic, computer architecture; or consent of instructor.*

CSE 237D. Design Automation and Prototyping for Embedded Systems (4)
System representation and modeling. Abstract and language models. Simulation as a modeling activity. Computational and hw/sw system prototypes. System analysis using models. Constraint and interface modeling. Behavioral compilation and synthesis. *Prerequisites: CSE 237A; or basic courses in digital logic design, algorithms and data structures, elementary calculus, discrete math, symbolic logic, computer architecture; or consent of instructor.*

CSE 240. Principles in Computer Architecture I (4)
Renumbered to CSE 240A (see below).

CSE 240A. Principles of Computer Architecture (4)
(Formerly CSE 240.) This course will cover fundamental concepts in computer architecture. Topics include instruction set architecture, pipelining, pipeline hazards, bypassing, dynamic scheduling, branch prediction, superscalar issue, memory-hierarchy design, advanced cache architectures, and multiprocessor architecture issues. *Prerequisite: CSE 141 or consent of instructor.*

CSE 241. Advanced Computer Architecture (4)
Renumbered to CSE 240B (see below).

CSE 240B. Advanced Computer Architecture (4)
(Formerly CSE 241.) This course covers advanced topics in computer architecture, including multiprocessor architecture, interconnection networks, cache coherence, cache consistency. It incorporates the latest research and development on topics such as branch prediction, instruction-level parallelism, multithreading, and cache hierarchy design. *Prerequisite: CSE 240A or consent of instructor.*

CSE 241A. Introduction to Computing Circuitry (4)
Integrated-circuit building blocks of computing systems, and impact on system implementation choices. Devices and interconnects, clocking, basic circuit types, power/ground distribution, arithmetic modules, memories. Design methods covering combinational logic networks, sequential machines, and basic subsystems. Tradeoffs in system implementation. *Prerequisite: CSE 140 or consent of instructor.*

CSE 242A. Integrated Circuit Layout Automation (4)
Couplings among timing, circuits and spatial embedding in nanometer-scale CMOS design. The role, and key problems, of physical layout in IC implementation. Example topics: RTL-to-GDSII methodologies, analyses and estimations, partitioning, floor planning, placement, routing, special net routing, cell generation, compaction. *Prerequisite: CSE 241A or consent of instructor.*

CSE 243A. Introduction to Synthesis Methodologies in VLSI CAD (4)
Hardware software co-design, architectural level synthesis, control synthesis and optimization, scheduling, binding, register and bus sharing, interconnect design, module selection, combinational logic optimization, state minimization, state encoding, and retiming. *Prerequisite: CSE 241A or consent of instructor.*

CSE 244A. VLSI Test (4)
Design for test, testing economics, defects, failures and faults, fault models, fault simulation, automatic test pattern generation, functional testing, memory, PLA, FPGA, microprocessor test, and fault diagnosis. *Prerequisite: CSE 241A or consent of instructor.*

CSE 244B. Testable and Fault Tolerant Hardware Design (4)
Scan path design, BIST architectures, test point insertion, self-checking circuits, test and fault tolerance in architectural synthesis, reconfigurable fault tolerant hardware, and SOC test design. *Prerequisite: CSE 244A or consent of instructor.*

CSE 245. Computer Aided Circuit Simulation and Verification (4)
This course is about the computer algorithms, techniques, and theory used in the simulation and verification of electrical circuits. *Prerequisite: CSE 241A or consent of instructor.*

CSE 246. Computer Arithmetic Algorithms and Hardware Design (4)
Number representation, fixed point adders, subtracters, and multipliers; modified booth's recoding, high-radix multiplication, (non)restoring dividers, SRT division, high-radix dividers, division by convergence, square-rooting, floating point arithmetic, rounding schemes, errors and error control, and floating point adders, subtracters, multipliers, dividers. *Prerequisite: CSE 241A or consent of instructor.*

CSE 247. Application Specific and Reconfigurable Computer Architecture (4)
This course covers architecture concepts used to tailor processors to a specific application or sets of applications. It covers Field-Programmable Gate Arrays (FPGAs), various forms of Application Specific Integrated Circuit (ASIC) designs, Application Specific Integrated Processors (ASIP), and augmenting customizable VHDL cores. *Prerequisite: CSE 241A or consent of instructor.*

CSE 248. Algorithmic and Optimization Foundations for VLSI CAD (4)
Algorithmic techniques and optimization frameworks for large-scale, difficult optimizations. Primal-dual multicommodity flow approximations, approximations for geometric and graph Steiner formulations, continuous placement optimization, heuristics for Boolean satisfiability, multilevel methods, semidefinite programming, and application to other formulations (e.g., scheduling). *Prerequisites: CSE 241A or CSE 242A or consent of instructor.*

CSE 249A. Topics/Seminar in Computer Architecture (1-4)
Topics of special interest in computer architecture to be presented by faculty and students under faculty direction. Topics vary from quarter to quarter. May be repeated for credit. *Prerequisite: consent of instructor.*

CSE 249B. Topics/Seminar in VLSI (1-4)
Topics of special interest in VLSI to be presented by faculty and students under faculty direction. Topics vary from quarter to quarter. May be repeated for credit. *Prerequisite: consent of instructor.*

CSE 249C. Topics/Seminar in CAD (1-4)
Topics of special interest in CAD to be presented by faculty and students under faculty direction. Topics vary from quarter to quarter. May be repeated for credit. *Prerequisite: consent of instructor.*

CSE 250A. Artificial Intelligence I (4)
(Formerly CSE 278A.) Issues in knowledge representation (using logic, semantic networks, production systems, and connectionist representations) will be the focus of this course. A discussion of logic programming languages (like PROLOG) and automatic theorem proving will then lead to a discussion of heuristic search. *Prerequisite: CSE 151 or equivalent.*

CSE 250B. Artificial Intelligence II (4)
(Formerly CSE 278B.) This course will discuss knowledge representations used to search for solutions, make deductions, plan, and problem solve. The application of these techniques to expert systems will be mentioned. Machine learning will also be a major topic of this course. *Prerequisite: CSE 250A.*

CSE 252A. Computer Vision I (4)
Comprehensive introduction to computer vision providing broad coverage including low-level vision (image formation, photometry, color, image feature detection), inferring 3-D properties from images (shape-from shading, stereo vision, motion interpretation) and object recognition. Companion to CSE 252B covering complementary topics. *Prerequisites: Math. 10D and Math. 20A-F or equivalent.*

CSE 252B. Computer Vision II (4)
Comprehensive introduction to computer vision providing focused coverage of multiview geometry, structure from motion, image segmentation, motion segmentation, texture analysis and recognition, object detection, and image-based rendering. Companion to CSE 252A covering complementary topics. *Prerequisites: Math. 10D and Math. 20A-F or equivalent.*

CSE 252C. Selected Topics in Vision and Learning (4)
Selected topics in computer vision and statistical pattern recognition, with an emphasis on recent developments. Possible topics include: grouping and segmentation, object recognition and tracking, multiple view geometry, kernel-based methods, dimensionality reduction, and mixture models. *Prerequisite: CSE 252 or equivalent and CSE 250B or equivalent.*

CSE 253. Neural Networks (4)
This course covers Hopfield networks, application to optimization problems, layered perceptrons, recurrent networks, and unsupervised learning. Programming exercises explore model behavior, with a final project on a cognitive science, artificial intelligence, or optimization problem of the student's choice. *Prerequisites: knowledge of C and consent of instructor.* (S/U grades permitted.)

CSE 254. Machine Learning (4)
(Formerly CSE 281T.) This course will discuss a wide range of techniques used to allow computers to learn directly from experience with their environment rather than requiring programming by humans. The

survey will span both high- and low-level learning techniques as well as theoretical models that allow these various techniques to be compared. (S/U grades permitted.) *Prerequisite: 250B.*

CSE 256. Statistical Natural Language Processing (4)
An introduction to modern statistical approaches to natural language processing: part of speech tagging, work sense disambiguation and parsing, using Markov models, hidden Markov models and probabilistic context free grammars. *Prerequisite: CSE 250B or equivalent experience.*

CSE 257. Computational Biology (4)
Computational methods are indispensable to an understanding of the vast datasets emerging from human and other organisms' genomes. This course surveys algorithms underlying genome analysis, sequence alignment, phylogenetic trees, protein folding, gene expression, metabolic pathways, and biological knowledge base design. *Prerequisite: Pharm 201 or consent of instructor.*

CSE 257A. Bioinformatics II: Sequence and Structure Analysis—Methods and Applications (4)
Introduction to methods for sequence analysis. Applications to genome and proteome sequences. Protein Structure, sequence-structure analysis.

CSE 257B. Algorithms in Computational Biology (4)
Renumbered to CSE 206B (see above).

CSE 258A. Connectionists Natural Language Processing (4)
(Formerly CSE 281P.) This course will explore connectionist (or parallel distributed processing) models and their relation to cognitive processes. The course will cover various learning algorithms and the application of the paradigm to models of language processing, memory, sequential processes, and vision. (S/U grades permitted.) *Prerequisite: CSE 250B or equivalent experience.*

CSE 259. Seminar in Artificial Intelligence (1)
A weekly meeting featuring local (and occasional external) speakers discussing their current research in Artificial Intelligence Neural Networks, and Genetic Algorithms. (S/U grades only.) *Prerequisite: none.*

CSE 260. Parallel Computation (4)
(Formerly CSE 274A.) This course provides an overview of parallel hardware, algorithms, models, and software. Topics include Flynn's taxonomy, interconnection networks, memory organization, a survey of commercially available multiprocessors, parallel algorithm paradigms and complexity criteria, parallel programming environments and tools for parallel debugging, language specification, mapping, performance, etc. *Prerequisite: graduate standing or consent of instructor.*

CSE 262. System Support for Applications of Parallel Computation (4)
This course will explore design of software support for applications of parallel computation. Topics include: programming languages, run time support, portability, and load balancing. The course will terminate in a project. *Prerequisite: consent of instructor.*

CSE 268A. Topics in Parallel Computation (4)
(Formerly CSE 281Y.) Current topics of interest in parallel computation will be discussed such as heterogeneous computing, advanced topics in parallel programming environments, parallel programming models, performance criteria, etc. (S/U grades permitted.) *Prerequisite: graduate standing or consent of instructor.*

CSE 268C. Topics in High-Performance Programming (4)
A systematic approach to the design, writing, and tuning of programs to sustain near-peak performance with particular emphasis on RISC processors and massively parallel computers. A project will involve measuring and improving the performance of a computational kernel. *Prerequisite: CSE 141 or consent of instructor.*

CSE 269. Seminar in Parallel Computation (1-4)
A seminar course in which topics of special interest in parallel computation will be presented by staff members and graduate students under faculty direction. Topics vary from quarter to quarter. May be repeated for credit. *Prerequisite: consent of instructor.* (S/U grades only.)

CSE 271. User Interface Design: Social and Technical Issues (4)
Web technologies (HTML, Java, JavaScript, etc.) can quickly build superb new systems, as well as phenomenally ugly systems that still fully meet their performance and functional requirements. This course explores interface usability and representation issues, with some focus on hypermedia and cooperative work. *Prerequisites: CSE 20, CSE 100, or equivalent.*

CSE 272. Advanced Appearance Modeling (4)
Computer graphics algorithms for creating a given appearance. The course will cover algorithms and physics necessary to simulate light transport, light scattering, reflection models, subsurface scattering, participating media, and procedural modeling and texturing. *Prerequisites: CSE 168 or equivalent, or consent of instructor.*

CSE 275. Social Aspects of Technology and Science (4)
Note: CSE 275 is pending CEP approval. Explores approaches to the sociology of technology and science, especially information technology. Topics include requirements engineering, actor-network theory, post-modernism, the Web, user interface design, and public policy. *Prerequisites: CSE 8B or CSE 11, and background in the humanities.*

CSE 290. Seminar in Computer Science and Engineering (1-4)
(Formerly CSE 280A.) A seminar course in which topics of special interest in computer science and engineering will be presented by staff members and graduate students under faculty direction. Topics vary from quarter to quarter. May be repeated for credit. (S/U grades only.) *Prerequisite: consent of instructor.* (Offered as faculty resources permit.)

CSE 291. Topics in Computer Science and Engineering (1-8)
(Formerly CSE 281A). Topics of interest in computer science and engineering. Topics may vary from quarter to quarter. May be repeated for credit with the consent of instructor. (S/U grades permitted.) *Prerequisite: consent of instructor.* (Offered as faculty resources permit.)

CSE 292. Faculty Research Seminar (1)
(Formerly CSE 282.) Computer science and engineering faculty will present one hour seminars of the current research work in their areas of interest. *Prerequisite: CSE graduate status.*

CSE 293. Special Project in Computer Science and Engineering (1-8)
(Formerly CSE 269.) The student will conceive, design, and execute a project in computer science under the direction of a faculty member. The project will typically include a large programming or hardware design task, but other types of projects are possible. One-six units may be repeated to a total of nine units. *Prerequisite: CSE graduate student status.* (S/U grades only.)

CSE 294. Research Meeting in CSE (2)
Advanced study and analysis of active research in computer science and computer engineering. Discussion of current research and literature in the research specialty of the staff member teaching the course. *Prerequisite: consent of instructor.*

CSE 298. Independent Study (1-16)
Open to properly qualified graduate students who wish to pursue a problem through advanced study under the direction of a member of the staff. (S/U grades only.) *Prerequisite: consent of instructor.*

CSE 299. Research (1-16)
Research. *Prerequisite: consent of faculty.*

CSE 500. Teaching Assistantship (2-4)
A course in which teaching assistants are aided in learning proper teaching methods by means of supervision of their work by the faculty: handling of discussions, preparation and grading of examinations and other written exercises, and student relations. May be used to meet teaching experience requirement for candidates for the Ph.D. degree. Number of units for credit depends on number of hours devoted to class or section assistance. *Prerequisites: graduate standing and consent of instructor.*

CSE 501. Teaching Assistantship (2-4)
Renumbered to CSE 500 (see above).

CSE 599. Teaching Methods in Computer Science (2)
Training in teaching methods in the field of computer science. This course examines theoretical and practical communication and teaching techniques particularly appropriate to computer science. *Prerequisite: consent of faculty.*

Electrical and Computer Engineering (ECE)

OFFICES:
Undergraduate Affairs, Room 2705
Graduate Affairs, Room 2718
Engineering Building Unit 1, Warren College
http://www.ece.ucsd.edu

Professors

Anthony S. Acampora, Ph.D.
Victor C. Anderson, Ph.D., *Emeritus*
(not in-residence)
Peter M. Asbeck, Ph.D.
H. Neal Bertram, Ph.D., *CMRR Endowed Chair II*
William S. C. Chang, Ph.D., *Research Professor*
William A. Coles, Ph.D.
Rene L. Cruz, Ph.D.
Sujit Dey, Ph.D.

Sadik C. Esener, Ph.D.
Shaya Fainman, Ph.D.
Ian Galton, Ph.D.
Michael J. Heller, Ph.D.
Carl W. Helstrom, Ph.D. *Emeritus*
Ramesh Jain, Ph.D., *Research Professor*
Andrew B. Kahng, Ph.D.
Kenneth Kreutz-Delgado, Ph.D.
Walter H. Ku, Ph.D.
Lawrence E. Larson, Ph.D., *CWC Industry Endowed Chair in Wireless Communications*
S. S. Lau, Ph.D.
Sing H. Lee, Ph.D.
Yu Hwa Lo, Ph.D.
Robert Lugannani, Ph.D.
Huey-Lin Luo, Ph.D.
Elias Masry, Ph.D.
D. Asoka Mendis, Ph.D., *Research Professor*
Laurence B. Milstein, Ph.D., *Academic Senate Distinguished Teaching Award*
Farrokh Najmabadi, Ph.D.
Truong Q. Nguyen, Ph.D.
Alon Orlitsky, Ph.D.
George Papen, Ph.D.
Kevin B. Quest, Ph.D., *Vice Chair*
Bhaskar Rao, Ph.D.
Ramesh Rao, Ph.D.
Barnaby J. Rickett, Ph.D.
Manuel Rotenberg, Ph.D., *Research Professor*
M. Lea Rudee, Ph.D., *Research Professor*
Victor H. Rumsey, PhD., *Emeritus (not in-residence)*
Vitali Shapiro, Ph.D.
Paul H. Siegel, Ph.D., *Director, Center for Magnetic Recording Research*
Bang-Sup Song, Ph.D., *Charles Lee Powell Endowed Chair in Wireless Communications*
David Sworder, Ph.D., *Associate Dean, OGSR*
Yuan Taur, Ph.D.
Mohan Trivedi, Ph.D.
Charles W. Tu, Ph.D.
Alexander Vardy, Ph.D.
Andrew J. Viterbi, Ph.D., *Emeritus (not in-residence)*
Harry H. Wieder, Ph.D., *Research Professor-in-Residence*
Jack K. Wolf, Ph.D., *Stephen O. Rice Professor of Electrical and Computer Engineering, Academic Senate Distinguished Teaching Award*
Edward T. Yu, Ph.D.
Paul Yu, Ph.D., *Chair*
Kenneth A. Zeger, Ph.D.

Associate Professors

Paul M. Chau, Ph.D.
Pamela C. Cosman, Ph.D.
Joseph Ford, Ph.D.
Clark C. Guest, Ph.D.
George J. Lewak, Ph.D., *Emeritus (not in-residence)*
Bill Lin, Ph.D.
Stojan Radic, Ph.D.
Anthony V. Sebald, Ph.D.
Kenneth Y. Yun, Ph.D.

Assistant Professors

Shayan Mookerjea, Ph.D.
Curt Schurgers, Ph.D.
Nuno Vasconcelos, Ph.D.
Deli Wang, Ph.D.

Adjunct Professors

C. K. Cheng, Ph.D., *Professsor, Computer Science and Engineering*
Pankaj K. Das, Ph.D., *Rensselaer Polytechnic Institute*
Madhu Gupta, Ph.D., *SDSU*
Robert Hecht-Nielsen, Ph.D., *Hecht-Nielsen Neurocomputing Corporation*
John A. Hildebrand, Ph.D., *Marine Physical Laboratory, Scripps Institution of Oceanography*
William S. Hodgkiss, Ph.D., *Professsor, Marine Physical Laboratory, Scripps Institution of Oceanography*
James U. Lemke, Ph.D., *Center for Magnetic Recording Research*
John Proakis, Ph.D., *Northeastern University*
Jin-Joo Song, Ph.D.

Associated Faculty

Gustaf O. S. Arrhenius, Ph.D., *Professor, Marine Research Division, Scripps Institution of Oceanography*
George Tynan, Ph.D., *Associate Professor, Mechanical and Aerospace Engineering*

Program Mission Statement

To educate tomorrow's technology leaders.

Program Educational Objectives

- To provide our students with training in the fundamental science and mathematics that underlie engineering, and with a general breadth and depth in engineering and in engineering design so that they are prepared for graduate school and for engineering careers. Students should have both proficiency in a specific technical area, and the flexibility and broad knowledge base needed for life-long engineering careers in a changing technical environment.
- To ensure that our students are educated in the classical sense. In particular, that they are broadly aware of social and environmental issues and of the impact of their profession on these issues.
- To assist our students in preparing themselves to work effectively in their profession. Specifically, to develop communications, teamwork, and leadership skills.

Program Outcomes and Assessment

Program outcomes have been established based on the Program Educational Objectives. Graduates of the ECE Program in Electrical Engineering are expected to have:

1. An understanding of the underlying principles of, and an ability to apply knowledge of mathematics, science, and engineering to electrical engineering problems
2. An ability to design and conduct experiments, as well as to analyze and interpret data
3. A knowledge of electrical engineering safety issues
4. An ability to design a system, component, or process to meet desired needs

5a. An ability to collaborate effectively with others

5b. An ability to function on multidisciplinary teams

6. An ability to identify, formulate, and solve engineering problems
7. An ability to use the techniques, skills, and modern engineering tools necessary for engineering practice, including familiarity with computer programming and information technology
8. An understanding of professional and ethical responsibility

9a. An ability to communicate effectively in writing

9b. An ability to communicate effectively in speech

9c. An ability to communicate effectively with visual means

10. The broad education necessary to understand the impact of engineering solutions in a global and societal context
11. A recognition of the need for, and the ability to engage in, life-long learning
12. A knowledge of contemporary issues

The Undergraduate Programs

The Department of Electrical and Computer Engineering offers undergraduate programs leading to the B.S. degree in **electrical engineering, engineering physics,** and **computer engineering**. Each of these programs can be tailored to provide preparation for graduate study or employment in a wide range of fields. The Electrical Engineering Program is accredited by the Accreditation Board for Engineering and Technology (ABET).

The Electrical Engineering Program has a common lower-division and a very flexible structure in the upper-division. After the lower-division core, all students take six breadth courses during the junior year. They must then satisfy a depth requirement which can be met with five courses focused on some speciality, and a design requirement of at least one project course. The remainder of the program consists of six electives which may range as widely or as narrowly as needed.

The Engineering Physics Program is conducted in cooperation with the Department of Physics. Its structure is very similar to that of electrical engineering except the depth requirement includes seven courses and there are only four electives.

The Computer Engineering Program is conducted jointly with the Department of Computer Science and Engineering. It has a more prescribed structure. The program encompasses the study of hardware design, data storage, computer architecture, assembly languages, and the design of computers for engineering, information retrieval, and scientific research.

For information about admission to the program and about academic advising, students are referred to the section on ECE departmental regulations. In order to complete the programs in a timely fashion, students must plan their courses carefully, starting in their freshman year. Students should have sufficient background in high school mathematics so that they can take freshman calculus in the first quarter.

For graduation, each student must also satisfy general-education requirements determined by the student's college. The six colleges at UCSD require widely different numbers of general-education courses. Students should choose their college carefully, considering the special nature of the college and the breadth of education required. They should realize that some colleges require considerably more courses than others. Students wishing to transfer to another college should see their college adviser.

Graduates of community colleges may enter ECE programs in the junior year. However, transfer students should be particularly mindful of the freshman and sophomore course requirements when planning their programs.

These programs have strong components in laboratory experiments and in the use of computers throughout the curricula. In addition, the department is committed to exposing students to the nature of engineering design. This is accomplished throughout the curricula by use of open-ended homework problems, by exposure to engineering problems in lectures, by courses which emphasize student-initiated projects in both laboratory and computer courses, and finally by senior design-project courses in which teams of students work to solve an engineering design problem, often brought in from industry.

IT IS IMPERATIVE THAT STUDENTS DISCUSS THEIR CURRICULUM WITH THE APPROPRIATE DEPARTMENTAL ADVISER IMMEDIATELY UPON ENTRANCE TO UCSD, AND THEN AT LEAST ONCE A YEAR UNTIL GRADUATION.

B.S. Electrical Engineering Program

Students must complete 180 units for graduation, including the general-education requirements (GER). Note that 144 units (excluding GER) are required.

LOWER-DIVISION REQUIREMENTS (total of 72 units)

Mathematics (24 units): Math. 20A-B-C-D-E-F.

Physics (16 units): Phys. 2A-B-C-D or Phys. 4A-B-C-D-E. Math. 20A is a prerequisite for Phys. 2A. Students whose performance on the mathematics placement test permits them to start with Math. 20B or higher may take Phys. 2A in the fall quarter of the freshman year.

Chemistry (4 units): Chem. 6A.

Programming Course (4 units): MAE 9 or (CSE 11 or 8A-B)

Electrical engineering (24 units): ECE 20A-B, ECE 30, ECE 60A-B, and ECE 60L.

Additional Notes:

1. Students can take either MAE 9 or (CSE 11 or 8A-B) Students interested in the computer design or software systems depths should enroll in CSE 11 or 8A-B.
2. Please note that electrical engineering students cannot take CSE 11 or 8A in the fall quarter of the freshman year. The fall quarter enrollment in CSE courses is reserved for computer science and computer engineering majors. CSE 8A and CSE 8B are not required if a student completes CSE 11. CSE 11 is a faster paced version of CSE 8A and CSE 8B. Students will self-select which course they wish to take. Students without programming experience in a compiled language are advised to take CSE 8A and then CSE 8B instead of CSE 11.
3. ECE 20A and 20B are offered every quarter; therefore, some students will be able to take ECE 20A in the fall quarter (*enrollment limited and priority for transfer students*). Other students will postpone taking ECE 20A until the winter or spring quarter of their freshman year.
4. Students taking CSE 8A-B may take ECE 20A in the spring quarter and ECE 20B in the fall quarter of their sophmore year. ECE 30 will be postponed to the spring quarter of the sophmore year.
5. Students with AP math credit are strongly advised to take Math. 20B in the fall quarter, leaving room for a GER in the winter quarter.
6. The ECE undergraduate Web site shows several scheduling options. Please refer to the Web site and consult with the staff advisers in the undergraduate offices, rooms 2705 and 2706 in EBU1.

UPPER-DIVISION REQUIREMENTS (total of 72 units)

a. Electrical Engineering BREADTH Courses (24 units)

Courses required of all electrical engineering majors:

The six courses, ECE 101, 102, 103, 107, 108, and 109 are required of all electrical engineering majors and they are an assumed prerequisite for senior-level courses, even if they are not explicitly required. Although the courses are largely independent, there are some prerequisites. ECE 102 is a prerequisite for ECE 108. Students who delay some of the breadth courses into the spring should be careful that it does not delay their depth sequence.

b. Electrical Engineering DESIGN Course (4 units)

Note: *In order to fulfill the design requirement, students must complete one of the following courses with a grade C– or better.* ***Graduation will not***

be approved until a written copy of the design project is submitted to the ECE undergraduate office.

The electrical engineering design requirement can be fulfilled in any of the following three ways:

1. Take ECE 191: Engineering Group Design Project
2. Take ECE 192: Engineering Design
   This course requires the department stamp. Specifications and enrollment forms are available in the undergraduate office.
3. Take one of the following courses:
   - ECE 111: Advanced Digital Design Project
   - ECE 118: Computer Interfacing
   - ECE 155B or 155C: Digital Recording Projects
   - Phys. 121: Experimental Techniques

   Students who wish to take one of these courses to satisfy the design requirement must fill out an enrollment form and have departmental approval for the design credit prior to taking the course. The project must meet the same specifications as ECE 192.

c. Electrical Engineering ELECTIVES (24 units)

- Three upper-division engineering, mathematics, or physics courses.
- Three additional electives which students may use to broaden their professional goals.

  (For additional information, please refer to the section on "Elective Policy for Electrical Engineering and Engineering Physics Majors.")

d. Electrical Engineering Depth Requirement (20 units)

Students must complete a "depth requirement" of at least five quarter courses to provide a focus for their studies. This set must include a clear chain of study of at least three courses which depend on the "breadth" courses. Students may choose one of the approved depth sequences listed below, or propose another with the approval of their faculty adviser. Some of the approved sequences have lower-division prerequisites and thus list six courses. Students choosing one of these sequences will have to complete only two "professional" electives. Guidelines for meeting the depth requirement can be obtained from the undergraduate office.

Electronics Circuits and Systems:
ECE 163, 164, 165, and any two of ECE 111, 118, 161A, 161B, 161C, and 166.

Electronic Devices and Materials:
ECE 135A, ECE 135B, 136L, 139, and 183.

Controls and Systems Theory:
ECE 171A, 171B, 174, 118, and 173.

Machine Intelligence:
ECE 173, 174, 172A and any two of ECE 175, 161A, 187, 253A, 285, and COGS 108F.

Photonics:
ECE 181, 182, 183, 184, and 185.

Communications Systems:
ECE 161A, 153, 154A-B-C.

Networks:
ECE 153, 159A, 159B, 158A-B.

Queuing Systems:
ECE 171A, 174, 159A-B, and Math. 181A.

Signal and Image Processing:
ECE 161A, 161B, 161C, 153, and ECE 172A or 174.

Computer Design:
CSE 12, 21, and 141, ECE 158A, 111 or 118, and 165.

Software Systems:
CSE 12, 21, 100, 101, 141, and 120.

B.S. Engineering Physics

Students must complete a total of 180 units for graduation, including the general-education requirements. Note that 146 units (excluding GER) are required.

All students will initially be placed in pre-major status. Upon successful completion of the following courses (with a minimum 2.0 GPA by the end of the first three quarters if a transfer student, six quarters if an incoming freshman), students will be admitted into full Engineering-Physics major status.

1. Math. 20A-B-C
2. Physics 2A-B
3. ECE 20A-B
4. CSE 11 or 8B, or MAE 9

To initiate the change from pre-major status to full major status, transfer students must see the ECE undergraduate adviser by the end of their third quarter at UCSD; incoming freshmen by the end of their sixth quarter.

Please refer to the sections "Undergraduate Regulations and Requirements" and "Acceptance to the Jacobs School of Engineering" for important details.

LOWER-DIVISION REQUIREMENTS (total of 74 units)

Mathematics (24 units): Math. 20A-B-C-D-E-F.

Physics (16 units): Phys. 2A-B-C-D or Phys. 4A-B-C-D-E. Math. 20A is a prerequisite for Phys. 2A. Students whose performance on the mathematics placement test permits them to start with Math. 20B or higher may take Phys. 2A in the fall quarter of the freshman year.

Physics Lab (2 units): Phys. 2DL is required.

Chemistry (4 units): Chem. 6A.

Programming Course (4 units): MAE 9 or (CSE 11 or 8A-B)

Electrical engineering (24 units): ECE 20A-B, ECE 30, ECE 60A-B, and ECE 60L.

Additional Notes:

1. Students can take either MAE 9 or (CSE 11 or 8A-B) Students interested in the computer design or software systems depths should enroll in CSE 11 or 8A-B.
2. Please note that electrical engineering students cannot take CSE 11 or 8A in the fall quarter of the freshman year. The fall quarter enrollment in CSE courses is reserved for computer science and computer engineering majors. CSE 8A and CSE 8B are not required if a student completes CSE 11. CSE 11 is a faster paced version of CSE 8A and CSE 8B. Students will self-select which course they wish to take. Students without programming experience in a compiled language are advised to take CSE 8A and then CSE 8B instead of CSE 11.
3. ECE 20A and 20B are offered every quarter; therefore, some students will be able to take ECE 20A in the fall quarter (*enrollment limited and priority for transfer students*). Other students will postpone taking ECE 20A until the winter or spring quarter of their freshman year.
4. Students taking CSE 8A-B may take ECE 20A in the spring quarter and ECE 20B in the fall quarter of their sophmore year. ECE 30 will be postponed to the spring quarter of the sophmore year.
5. Students with AP math credit are strongly advised to take Math. 20B in the fall quarter, leaving room for a GER in the winter quarter.
6. The ECE undergraduate Web site shows several scheduling options. Please refer to the Web site

and consult with the staff advisers in the undergraduate offices, rooms 2705 and 2706 in EBU1.

UPPER-DIVISION REQUIREMENTS (72 units)

a. Engineering Physics BREADTH Courses (24 units)

The electrical engineering breadth courses ECE 101, 102, 103, 107, 108, and 109, are also required of engineering physics majors. However, because of the scheduling of Math. 110, Phys. 110A and 130A, they can only be taken in a specific order (please consult the ECE Web site).

b. Engineering Physics DESIGN Course (4 units)

Note:** In order to fulfill the design requirement, students must complete one of the following courses with a grade C– or better.* ***Graduation will not be approved until a written copy of the design project is submitted to the ECE undergraduate office.

The engineering physics design requirement can be fulfilled in any of the following three ways:

1. Take ECE 191: Engineering Group Design Project
2. Take ECE 192: Engineering Design
   This course requires the department stamp. Specifications and enrollment forms are available in the undergraduate office.
3. Take one of the following courses:
   - ECE 111: Advanced Digital Design Project
   - ECE 118: Computer Interfacing
   - ECE 155B or 155C: Digital Recording Projects
   - Physics 121: Experimental Techniques

   Students who wish to take one of these courses to satisfy the design requirement must fill out an enrollment form and have departmental approval for the design credit prior to taking the course. The project must meet the same specifications as ECE 192.

c. Engineering Physics ELECTIVES (16 units)

- One upper-division engineering, mathematics, or physics course.
- Three additional electives which students may use to broaden their professional goals.

  (For additional information, please refer to the section on Elective Policy for Electrical Engineering and Engineering Physics Majors.)

d. Engineering Physics DEPTH Courses (28 Units)

All B.S. engineering physics students are required to take Phys. 110A, 130A-B, 140A, Math. 110, ECE 123 and 166; or ECE 135A and 135B; or ECE 182 and (181 or 183).

Elective Policy for Electrical Engineering and Engineering Physics Majors

1. Technical Electives:

Technical electives must be upper-division engineering, math or physics courses (except for the bioengineering track). Certain courses listed below are not allowed as electives because of overlap with ECE courses.

Physics: Students may not receive upper-division elective credit for any lower-division physics courses. Students may not receive credit for both Phys. 100A and ECE 107, Phys. 100B and ECE 107, Phys. 100C and ECE 123.

Mathematics: Math. 180A-B overlap ECE 109 and 153, and therefore will not qualify for elective credit of either type. Math. 183 will not be allowed as an elective. Math. 163 will only be allowed as a professional elective. All lower-division mathematics is excluded from elective credit of either type.

Bioengineering: The following series of courses will provide "core" preparation in bioengineering and will satisfy five of the ECE technical elective requirements:

- BILD 1, BILD 2, BE 100, BE 140A-B.

The bioengineering department will guarantee admission to these courses for ECE students on a space available basis.

CSE: The following courses are excluded as electives: CSE 1, 2, 5A-B, 8A-B, 11, 140 (duplicates ECE 20B), 140L (duplicates ECE 20B), 143 (duplicates ECE 165). CSE 12, 20, and 21 will count toward the three professional electives *ONLY*.

Mechanical and Aerospace Engineering (MAE): Credit will not be allowed for MAE 105, 139, 140, 143B, or 170.

Special Studies Courses 195–199: At most four units of 195–199 may be used for elective credit.

2. Professional Electives:

Normally these will be upper-division courses in engineering, mathematics, or physics. Students may also choose upper-division courses from other departments provided that they fit into a coherent professional program. In such cases, a lower-division prerequisite may be included in the electives. Courses other than upper-division engineering, mathematics, or physics must be justified in terms of such a program, and must be approved by a faculty adviser.

Biology and Chemistry: Of the three electives intended to allow for the professional diversity, one lower-division biology or chemistry course from BILD 1, 2, Chem. 6B-C may be counted for credit. Furthermore, this will count only if the student can demonstrate to a faculty adviser that they constitute part of a coherent plan for professional/career development.

Upper-division biology and chemistry courses will count toward the three professional electives but not the three math/physics/engineering electives.

Economics: Suitable electives would include:

Economics 1 followed by courses in one of the following tracks:

- Public and Environmental Economics: Select 2—Economics 118A-B, 130, 131, 132, 137.
- Labor and Human Resources: Select 2—Economics 136, 137, 138A-B, 139.
- Microeconomics: Economics 100A-B or 170A-B.
- Finance Track (MBA) I: Must complete all 3—Economics 4, 173, and another upper-division Economics elective.
- Finance Track (MBA) II: Economics 1A, 100A or 170A, and 175.
- Operations Research: Must complete 172 A—Economics 172A and (172B or 172C).

Economics 3 followed by courses in one of the following tracks:

- Monetary Economics: Economics 111 and another upper-division Economics Elective.
- Macroeconomics: Economics 110A-B.

***Note:** Economics 120A, and 158A-B will not be allowed as professional electives.*

B.S. Computer Engineering

Students wishing to pursue the computer engineering curriculum must be admitted to either the ECE or CSE department. **The set of required courses and allowed electives is the same in both departments;** please note that the curriculum requires twenty upper-division courses. The Computer Engineering Program requires a total of 147 units (not including the general-education requirements).

The Computer Engineering Program offers a strong emphasis on engineering mathematics and other basic engineering science as well as a firm grounding in computer science. Students should have sufficient background in high school mathematics so that they can take freshman calculus in their first quarter. Courses in high school physics and computer programming, although helpful, are not required for admission to the program.

LOWER-DIVISION REQUIREMENTS (total of 70 units)

Mathematics (20 units): Math. 20A-B-C-D-F.

Physics (16 units): Phys. 2A-B-C-D, or Phys. 4A-B-C-D. Math. 20A is a prerequisite for Phys. 2A. Students whose performance on the mathematics placement test permits them to start with Math. 20B or higher may take Phys. 2A in the fall quarter of the freshman year.

Physics lab (2 units): Phys. 2BL or 2CL or 2DL. The lab course should be taken concurrently with the Phys. 2 or Phys. 4 sequence.

Computer Science (21 units): CSE 11 or 8B*, 12, CSE 20 or Math. 15A, CSE 21 or Math. 15B, CSE 30, and CSE 91.

* CSE 8A and CSE 8B are not required if a student completes CSE 11. CSE 11 is a faster paced version of CSE 8A and CSE 8B. Students will self-select which course they wish to take. Students without programming experience in a compiled language are advised to take CSE 8A and then CSE 8B instead of CSE 11.

Electrical Engineering (12 units): ECE 53A-B, ECE 109.

UPPER-DIVISION REQUIREMENTS (total of 76 units)

a. All B.S. computer engineering students are required to take CSE 100 or Math. 176, CSE 101 or Math. 188, CSE 105 or Math. 166, CSE 120, 131A-B, 140, 140L (CSE 140 and 140L must be taken concurrently), 141, 141L (CSE 141 and 141L must be taken concurrently).

b. In addition, all B.S. computer engineering students must fulfill the following upper-division ECE requirements:

- Engineering Probability and Statistics ECE 109. This course can be taken in the sophomore year.
- Electronic Circuits and Systems ECE 102 and 108. The department recommends that these courses be taken in the junior year.
- Linear systems ECE 101 and 171A or 161A.

c. Technical electives: All B.S. computer engineering majors are required to take six technical electives.

- One technical elective must be either ECE 111 or ECE 118.
- Of the remaining five technical electives, four must be ECE or CSE upper-division or graduate courses.
- The remaining course can be any upper-division course listed under the non-CSE/ECE electives. (See the section on electives below.)

Electives

The discipline of computer engineering interacts with a number of other disciplines in a mutually beneficial way. These disciplines include mathematics, computer science, and cognitive science. The following is a list of upper-division courses from these and other disciplines that can be counted as technical electives.

At most four units of 197, 198, or 199 may be used towards technical elective requirements. ECE/CSE 195 cannot be used towards course requirements. Undergraduate students must get instructor's permission and departmental stamp to enroll in a graduate course.

Students may not get duplicate credit for equivalent courses. The *UCSD General Catalog* should be consulted for equivalency information and any restrictions placed on the courses. Additional restrictions are noted below. Any deviation from this list must be petitioned.

Mathematics: All upper-division courses except Math. 168A-B, 179A-B, 183, 184A-B, 189A-B, and 195–199. If a student has completed CSE 167, then he or she cannot get elective credit for Math. 155A. Students may receive elective credit for only one of the following courses: CSE 164A, Math. 174, Math. 173, Phys. 105A-B, MAE 107, CENG 100. No credit for any of these courses will be given if Math. 170A-B-C is taken. Students will receive credit for either Math. 166 or CSE 105 (but not both), either Math. 188 or CSE 101 (but not both), and either Math. 176 or CSE 100 (but not both).

Computer Science and Engineering: All CSE upper-division courses except CSE 195. Students will receive credit for either CSE 123A or ECE 158A (but not both) and CSE 143 or ECE 165 (but not both).

Cognitive Science: Sensation and Perception 101A, Learning, Memory, and Attention 101B, Language 101C, Distributed Cognition 102A, Cognitive Ethnography 102B, Cognitive Engineering 102C, Neuroanatomy and Physiology 107A, Systems Neuroscience 107B, Cognitive Neuroscience 107C, Programming Methods for Cognitive Science 108D, Neural Networks Models of Cognitive I 108E, Advanced Programming Methods for Cognitive Science 108F, Human Computer Interaction 120, Human Computer Interaction Programming 121, Semantics 150, Language Comprehension 153, Natural and Artificial Symbolic Representational Systems 170, Neural Network Models of Cognition II 181, Artificial Intelligence Modeling II 182.

Students may not get credit for both CSE 150 and Advanced Programming Methods for Cognitive Science 108F or for both CSE 151 and Artificial Intelligence Modeling II 182.

Mechanical and Aerospace Engineering (MAE): All upper-division MAE courses except MAE 140, and MAE 195-199.

Students may receive elective credit for only one of the following courses: CSE 164A, Math. 174, Math. 173, Phys. 105A-B, CENG 100, MAE 107. Students may only get credit for one of the two courses, CSE 167 or MAE 152.

Economics: Microeconomics 100A-B, Game Theory 109, Macroeconomics 110A-B, Mathematical Economics 113, Econometrics 120B-C, Applied Econometrics 121, Management Science Microeconomics 170A-B, Decisions Under Uncertainty 171, Introduction to Operations Research 172A-B-C, Economic and Business Forecasting 178.

Students cannot take Economics 120A since it duplicates ECE 109.

Linguistics: Phonetics 110, Phonology I 111, Phonology II 115, Morphology 120, Syntax I 121, Syntax II 125, Semantics 130, Mathematical Analysis of Languages 160, Computers and Language 163, Computational Linguistics 165, Psycholinguistics 170, Language and the Brain 172, and Sociolinguistics 175.

Engineering: Team Engineering 101 (see course description under the Jacobs School of Engineering section).

Music: Computer Music II 172, Audio Production: Mixing and Editing 173.

Psyschology: Engineering Psychology 161.

Minor Curricula

ECE offers three minors in accord with the general university policy that a minor requires five upper-division courses. ***Students must realize that***

these upper-division courses have extensive lower-division prerequisites (please consult the ECE undergraduate office). Students should also consult their college provost's office concerning the rules governing minors and programs of concentration.

Electrical Engineering: 20 units chosen from the breadth courses ECE 101, 102, 103, 107, 108, 109.

Engineering Physics: 20 units chosen from the junior year courses Phys. 110A, 130A, Math. 110, ECE 101, 102, 103, 107, 108, 109.

Computer Engineering: 20 units chosen from the junior year courses ECE 102, 108, CSE 100, 101, 105, 120, 140, 140L, 141, 141L.

The department will consider other mixtures of upper-division ECE, CSE, physics, and mathematics courses by petition.

Undergraduate Admissions, Policies, and Procedures

Freshman eligibility

1. **Computer Engineering majors:**

   Admission to the computer engineering major is currently restricted as described in the section "Admission to the School of Engineering." The only way to become a computer engineering (CE) major is to be directly admitted as an entering freshman or as an entering transfer (Transfer students, see TRANSFER STUDENTS section below).

   Space permitting and at its sole discretion, the electrical and computer engineering department may periodically grant admission to the computer engineering (CE) major to a small number of academically exceptional UCSD undergraduate students who were not admitted to this major as entering students. Exceptional admission will be considered for students having an overall UCSD GPA of 3.5 or better who have taken at least two CSE, math, or science courses demonstrating special aptitude for the CE curriculum. Applications for exceptional admission must include submission of a course plan demonstrating ability to satisfy graduation requirements and a personal statement addressing the applicant's motivation to join the CE major, in addition to other criteria established by the department.

2. **Electrical Engineering:**

   Freshmen students who have excelled in high school and have declared electrical engineering on their application will be directly admitted by the dean of the School of Engineering into their major. The only way to become an electrical engineering major is to be directly admitted as an entering freshman (transfer students see *Transfer Students* section below). These students will be notified directly of their status.

   Because of heavy student interest in departmental programs and the limited resources available to accommodate this demand, maintenance of a high quality program makes it necessary to limit enrollment to the most qualified students.

   Admission to the department as a major, transfer, or minor is in accordance with the general requirements established by the School of Engineering.

   Space permitting and at its sole discretion, the electrical and computer engineering department may periodically grant admission to the electrical engineering (EE) major to a small number of academically exceptional UCSD undergraduate students who were not admitted to this major as entering students. Exceptional admission will be considered for students having an overall UCSD GPA of 3.5 or better who have taken at least two CSE, math, or science courses demonstrating special aptitude for the EE curriculum. Applications for exceptional admission must include submission of a course plan demonstrating ability to satisfy graduation requirements and a personal statement addressing the applicant's motivation to join the EE major, in addition to other criteria established by the department.

3. **Engineering Physics:**

All students will initially be placed in pre-major status. Upon successful completion of the following courses (with a minimum 2.0 GPA by the end of the first three quarters if a transfer student, six quarters if an incoming freshman), students will be admitted into full Engineering-Physics major status.

1. Math. 20A-B-C
2. Physics 2A-B
3. ECE 20A-B
4. CSE 11 or 8B, or MAE 9

To initiate the change from pre-major status to full major status, transfer students must see the ECE undergraduate adviser by the end of their third quarter at UCSD; incoming freshmen by the end of their sixth quarter.

Please refer to the sections "Undergraduate Regulations and Requirements" and "Acceptance to the Jacobs School of Engineering" for important details.

Transfer Students Eligibility

Effective **fall 2004**, it is **strongly recommended** that transfer students complete the following preparation for engineering majors*:

- Calculus I—for Science and Engineering (Math. 20A)
- Calculus II—for Science and Engineering (Math. 20B)
- Calculus and Analytic Geometry (Math. 20C)
- Differential Equations (Math. 20D)
- Linear Algebra (Math. 20F)
- Complete calculus-based physics series with lab experience (Physics 2A-B-C)
- Chemistry 6A (except Computer Science and Computer Engineering majors)
- Highest level of introductory computer programming language course offerings at the community college**

*Effective **fall 2006**, these courses will be **required** preparation for all engineering transfer students.

**Refer to the *UCSD General Catalog* to select major prerequisite requirement for computer language courses.

1. **Computer Engineering:**

   The B.S. in Computer Engineering is a heavily impacted major and admission is limited to applicants who have demonstrated a high level of achievement commensurate with the prospect of success in this major. Successful applicants must have completed substantial training at the community college and must have achieved a high level of academic performance there. For example, the required minimum of ninety quarter transfer units must include eighteen quarter units of calculus, twelve quarter units of calculus-based physics, and the highest level computer science course offered at their community college. Although the actual required GPA cutoff depends on the number of

openings, at least a 3.2 GPA in the community college transfer courses, and a 3.4 GPA in math, physics and computer science courses, are likely to be needed to gain admission.

When planning their programs, students should be mindful of lower-division prerequisites necessary for admission to upper-division courses.

Effective fall 2004 applicants seeking admission as transfer students will be considered for direct admission into the Computer Engineering (CE) major in the Department of Electrical and Computer Engineering (ECE). The only way to become a Computer Engineering (CE) major is to be directly admitted as an entering transfer student.

2. **Electrical Engineering:**

The B.S. in Electrical Engineering is heavily impacted and admission is limited to applicants who have demonstrated a high level of achievement commensurate with the prospect of success in these majors. Successful applicants must have completed substantial training at the community college and must have achieved high level of academic performance there. For example, the required minimum of 90 quarter transfer units must include 18 quarter units of calculus, 12 quarter units of calculus-based physics, and the highest level computer science course offered at their community college.

Effective fall 2004, applicants seeking admission as transfer students will be considered for direct admission into the electrical engineering major in the Department of Electrical Engineering. The only way to become an electrical engineering major is to be directly admitted as an entering transfer student. Although the actual required GPA cutoff depends on the number of openings, at least a 3.2 GPA in the community college transfer courses, and a 3.4 GPA in math, physics, and computer science courses, are likely to be needed to gain admission. Transfer students who have declared pre-electrical engineering will be considered for direct admission to the major.

There will be no pre-major admissions to Electrical Engineering.

Space permitting and in its sole discretion, the electrical engineering department may periodically grant admissionto the electrical engineering major to a small number of academically exceptional UCSD undergraduate students who were not admitted to these majors as entering students. Exceptional admission will be considered for students having an overall UCSD GPA of 3.5 or better who have taken at least two ECE, math, or science courses demonstrating special aptitude for the EE curriculum. Applications for exceptional admission must include submission of a course plan demonstrating ability to satisfy graduation requirements and a personal statement addressing the applicant's motivation to join the electrical engineering major, in addition to other criteria established by the department.

3. **Engineering Physics:**

Students are accepted into the pre-major and must complete the following courses in order to be accepted into the engineering physics major: Math. 20A-B-C, Phys. 2A-B, ECE 20A-B, CSE 11 or 8B or MAE 9. Students who wish to enter in the engineering physics major must contact the department before the beginning of the fall quarter, submitting course descriptions and transcripts for courses used to satisfy their lower-division requirements. Normally, admission will be for the fall quarter; students entering in the winter or spring quarter should be aware that scheduling difficulties may occur because upper-division sequences normally begin in the fall quarter.

Grade Requirement in the Major

Courses required for the major must be taken for a letter grade.

A GPA of 2.0 is required in all upper-division courses in the major, including technical electives. The grade of D will not be considered an adequate prerequisite for any ECE course and will not be allowed for graduation. The engineering design requirement must be completed with a grade of C– or better.

Advising

Students are required to complete an academic planning form and to discuss their curriculum with the appropriate departmental adviser immediately upon entrance to UCSD, and then every year until graduation. This is intended to help students in: a) their choice of depth sequence, b) their choice of electives, c) keeping up with changes in departmental requirements. A faculty adviser will be assigned by the ECE department undergraduate office.

New Transfer Students in Electrical Engineering and Engineering Physics

The entire curriculum is predicated on the idea of actively involving students in engineering from the time they enter as freshmen. The freshman course "Introduction to Engineering" has been carefully crafted to provide an overview of the engineering mindset with its interrelationships among physics, mathematics, problem solving, and computation. All later courses are specifically designed to build on this foundation. All transfer students should understand that the lower-division curriculum is demanding. **Transfer students will be required to take all lower-division requirements or their equivalent.**

- Transfer students should start with ECE 20A in the fall quarter. Transfer students will be allowed to take ECE 20B and 60A concurrently. The recommended schedule for the lower-division ECE course is as follows:

Recommended Schedule

FALL	WINTER	SPRING
ECE 20A	ECE 20B	ECE 60B
MAE 9 or (CSE 11 or 8B)*	ECE 60A	ECE 60L

* Please note that engineering physics students cannot take CSE 11 or 8A in the fall quarter of the freshman year. (The fall quarter enrollment in CSE courses is reserved for computer science and computer engineering majors.) CSE 8A and CSE 8B are not required if a student completes CSE 11. CSE 11 is a faster paced version of CSE 8A and CSE 8B. Students will self-select which course they wish to take. Students without programming experience in a compiled language are advised to take CSE 8A and the CSE 8B instead of CSE 11.

Note: ECE 30 requires MAE 9 or (CSE 11 or 8B) and ECE 20B as a prerequisite and thus should be taken in the spring quarter of the sophomore year, or in the fall quarter of the junior year, concurrently with two upper-division breadth courses.

New Transfer Students in Computer Engineering

Recommended Schedules

FALL	WINTER	SPRING
FIRST YEAR*		
CSE 11	CSE 12	CSE 30
CSE 20 (or Math. 15A)	CSE 21 (or Math. 15B)	ECE 109
CSE 91	ECE 53A	ECE 53B

FIRST YEAR**		
CSE 8A	CSE 8B	CSE 20 (or
ECE 53A	ECE 53B	Math. 15A)
	CSE 12	CSE 30
		ECE 109

* Recommended schedule for students with programming experience. This schedule will require students to get clearance from the CSE department to take CSE 8B and CSE 20 concurrently

** Recommended schedule for students with no programming experience. This schedule will require students to get clearance from the CSE department to take CSE 8B and CSE 12 in the winter quarter, and CSE 20 and CSE 30 concurrently in the spring quarter. CSE 21 should then be taken during the summer sessions or the following fall quarter.

Students who do not have any programming experience are encouraged to take the CSE 8A-B sequence instead of CSE 11. Experience has shown that most students who are not familiar with programming and take CSE 11 have to retake the class because the accelerated pace makes it difficult to learn the new material.

Note: *Transfer students are encouraged to consult with the ECE undergraduate office for academic planning upon entrance to UCSD.*

ECE Honors Program

The ECE Undergraduate Honors Program is intended to give eligible students the opportunity to work closely with faculty in a project, and to honor the top graduating undergraduate students.

Eligibility for Admission to the Honors Program:

1. Students with a minimum GPA of 3.5 in the major and 3.25 overall will be eligible to apply. Students may apply at the end of the winter quarter of their junior year and no later than the end of the second week of fall quarter of their senior year. No late applications will be accepted.
2. Students must submit a project proposal (sponsored by an ECE faculty member) to the honors program committee at the time of application.
3. The major GPA will include ALL lower-division required for the major and all upper-division required for the major that are completed at the time of application (a minimum of twenty-four units of upper-division course work).

Requirements for Award of Honors:

1. Completion of all ECE requirements with a minimum GPA of 3.5 in the major based on grades through winter quarter of the senior year.
2. Formal participation (i.e., registration and attendance) in the ECE 290 graduate seminar program in the fall quarter of their senior year.
3. Completion of an eight-unit approved honors project (ECE 193H: Honors Project) and submission of a written report **by the first day of spring quarter** of the senior year. This project must contain enough design to satisfy the ECE BS four-unit design requirement.
4. The ECE honors committee will review each project final report and certify the projects which have been successfully completed at the honors level.

Procedure for Application to the Honors Program:

Between the end of the winter quarter of their junior year and the second week of the fall quarter of their senior year, interested students must advise the department of their intention to participate by submitting a proposal for the honors project sponsored by an ECE faculty member. Admission to the honors program will be formally approved by the ECE honors committee based on GPA and the proposal.

Unit Considerations

Except for the two-unit graduate seminar, this honors program does not increase a participant's total unit requirements. The honors project will satisfy the departmental design requirement and students may use four units of their honors project course as a technical elective.

Five-Year B.S./M. Eng. Program

Undergraduates in the ECE department who have maintained a good academic record in both departmental and overall course work are encouraged to participate in the five-year B.S./M. Eng. program offered by the department. Participation in the program will permit students to complete the requirements for the M. Eng. degree within one year following receipt of the B.S. degree. Complete details regarding admission to and participation in the program are available from the ECE Undergraduate Affairs office.

Admission to the Program

Students should submit an application for the B.S./M. Eng. program, including three letters of recommendation, by the program deadline during the spring quarter of their junior year. Applications are available from the ECE Undergraduate Affairs office. No GRE's are required for application to the B.S./M. Eng. program. A GPA of at least 3.0 both overall and in the major and strong letters of recommendation are required to be considered for program admission.

In the winter quarter of the senior year, applications of students admitted to the program will be forwarded by the department to the UCSD Office of Graduate Studies and Research. Each student must submit the regular graduate application fee *prior to the application deadline* for their application to be processed. Students who have been accepted into the B.S./M. Eng. program will automatically be admitted for graduate study beginning the following fall provided they maintain an overall GPA through the winter quarter of the senior year of at least 3.0. Upper-division (up to twelve units) or graduate courses taken during the senior year that are not used to satisfy undergraduate course requirements may be counted towards the forty-eight units required for the M. Eng. degree.

Continuation in the Program

Once admitted to the B.S./M. Eng. program, students must maintain a 3.0 cumulative GPA in all courses through the winter quarter of the senior year and in addition must at all times maintain a 3.0 cumulative GPA in their graduate course work. Students not satisfying these requirements may be re-evaluated for continuation in the program.

Admission for graduate study through the B.S./M. Eng. program will be for the M. Eng. degree only. Undergraduate students wishing to continue towards the Ph.D. degree must apply and be evaluated according to the usual procedures and criteria for admission to the Ph.D. program.

Curriculum

Students in the five-year B.S./M. Eng. program must complete the same requirements as those in the regular M. Eng. program. Completion of the M. Eng. degree requirements within one year following receipt of the B.S. degree will generally require that students begin graduate course work in their senior year. All requirements for the B.S.

degree should be completed by the end of the senior (fourth) year, and the B.S. degree awarded prior to the start of the fifth year. Courses taken in the senior year may be counted toward the B.S. requirements or the M. Eng. degree requirements, but not both. *Students must have received their B.S. degree before they will be eligible to enroll as graduate students in the department.*

The Graduate Programs

The department offers two distinct graduate programs, the Ph.D. and the M. Eng. The Ph.D. program is strongly research oriented and is for students whose final degree objective is the Ph.D. If a student with a B.S. is admitted to this program, he or she will be expected to complete the requirements for the M.S. degree (outlined below) before beginning doctoral research. By contrast, the M. Eng. is intended to be a terminal professional degree, for those not planning to pursue the Ph.D. The M. Eng. has only a coursework requirement. Graduate applicants are admitted directly into the M. Eng. or the Ph.D. programs only.

In addition, the department offers M.S. and Ph.D. Programs in Computer Engineering jointly with CSE, and a Ph.D. Program in Applied Ocean Science jointly with MAE and Scripps Institution of Oceanography.

Admission to an ECE graduate program is in accordance with the general requirements of the UCSD graduate division, and requires at least a B.S. degree in engineering, physical sciences, or mathematics with a minimum upper division GPA of 3.0. Applicants must provide three letters of recommendation and recent GRE General Test scores. TOEFL scores are required from international applicants whose native language is not English. Applicants should be aware that the University does not permit duplication of degrees.

Support: The department makes every effort to provide financial support for Ph.D. students who are making satisfactory progress. Support may take the form of a fellowship, teaching assistantship, research assistantship, or some combination thereof. International students will not be admitted unless there is reasonable assurance that support can be provided for the duration of their Ph.D. program. Students in the M.Eng. programs may also obtain support through teaching or research assistantships, but this is less certain.

Advising: Students should seek advice on requirements and procedures from the departmental graduate office and/or the departmental Web site http://www.ece.ucsd.edu. All students will be assigned a faculty academic adviser upon admission and are strongly encouraged to discuss their academic program with their adviser immediately upon arrival and subsequently at least once per academic year.

Master of Engineering

The Master of Engineering (M. Eng.) program is intended primarily for engineers who desire Master's level work but do not intend to continue with Ph.D. level research. Salient features of the M. Eng. program include the following: It can be completed in four quarters at full-time or eight quarters at half time; it does not require a thesis, a research project, or a comprehensive exam; and it has an option of three courses in business, management, and finance.

Course Requirements:

The total course requirements are forty-eight units (twelve quarter courses). The choice of courses is subject to general focus and breadth requirements. Students will be assigned a faculty adviser who will help select courses.

1. **The Focus Requirement: (five courses)** The M. Eng. Program should reflect, among other things, a continuity and focus in one subject area. The course selection must therefore include at least twenty units (five quarter courses) in closely related courses leading to the state of the art in that area. The requirement may be met by selecting five courses from within one of the focus areas listed below. In some cases it may be appropriate to select five closely related courses from two of the areas listed below. Such cases must be approved by a faculty adviser and the ECE Graduate Curriculum Committee.
2. **The Breadth Requirement: (two courses)** A graduate student often cannot be certain of his or her future professional career activities and may benefit from exposure to interesting opportunities in other subject areas. The breadth requirement is intended to provide protection against technical obsolescence, open up new areas of interest, and provide for future self-education. The minimum breadth requirement is eight units (two quarter courses) of ECE/CSE graduate courses selected from among the courses listed below, in an area distinctly different from that of the focus requirement.
3. **Technical Electives: (two courses)** Two technical electives may be any graduate courses in ECE, CSE, Physics, or Mathematics. Other technical courses may be selected with the approval of the faculty adviser and the ECE Graduate Curriculum Committee. Technical electives may include a maximum of four units of ECE 298 (Independent Study), or ECE 299 (Research).
4. **Professional Electives: (three courses)** The three professional electives may be used in several ways: for the IP/Core 401, 420, 421 series in business, management, and finance; for upper-division undergraduate technical courses specified as prerequisites for graduate-level focus, breadth, or technical elective courses taken to satisfy the M.Eng. degree requirements; or for additional graduate technical electives. Use of other courses to satisfy the Professional Elective requirement must be approved by the faculty adviser.

Scholarship Requirement: The forty-eight units of required course work must be taken for a letter grade (A-F), except for ECE 298 or 299, for which only S/U grades are allowed. Courses for which a D or F is received may not be counted. Students must maintain a GPA of 3.0 overall.

Master of Engineering Program Focus Courses

Please consult the ECE graduate office or the ECE Web site http://www.ece.ucsd.edu for the current list of focus areas and courses.

1. **Applied Physics**

   Allied Ph.D. research areas: Applied Physics—Applied Optics, Applied Physics—Electronic Devices and Materials, Photonics, Radio Space Science, and Magnetic Recording.

   ECE 222A-B-C. Electromagnetic Theory

   ECE 230A-B-C. Solid State Electronics

   ECE 236A-B-C-D. Semiconductors

   ECE 238A-B. Materials Science

   MS 201A-B-C. Materials Science

   ECE 240A-B-C. Optics

   ECE 241A-B-C. Optics

2. Communications and Signal Analysis

Allied Ph.D. research areas: Communication Theory and Systems, Intelligent Systems, Robotics, and Control, Magnetic Recording, Signal and Image Processing.

ECE 153. Random Processes

ECE 250. Random Processes

ECE 251AN-BN-CN-DN. Digital Signal Processing

ECE 252A-B. Speech Compression and Recognition

ECE 253A-B. Digital Image Analysis

ECE 254. Detection Theory

ECE 255A. Information Theory

ECE 255B-C. Source Coding

ECE 256A-B. Time Series Analysis

ECE 257A-B. Wireless Communications

ECE 258A-B. Digital Communications

ECE 259AN-BN-CN. Channel Coding

ECE 273A-B-C. Optimization in Linear Vector Spaces

ECE 275A-B. Statistical Parameter Estimation

ECE 285. Special Topic: Computer Vision; Pattern Recognition (offerings vary annually)

3. Electronic Circuits and Systems

Allied Ph.D. Research areas: Computer Engineering, Electronic Circuits and Systems.

ECE 222A-B-C. Applied Electromagnetic Theory

ECE 230A-B-C. Solid State Electronics

ECE 236A-B-C. Semiconductor Heterostructure Materials

ECE 250. Random Processes

ECE 260A-B-C. VLSI Circuits

ECE 263A-B-C. Fault Tolerant Computing

ECE 264A-B-C. Analog IC Design

ECE 265A-B. Wireless Circuit Design

CSE 240A, 240B. Computer Architecture

CSE 242A, 243A. Computer Aided Design

Transferring to the Ph.D. program

Although the M. Eng. is intended as a terminal degree, the department recognizes that degree goals can change, including the possibility that a student admitted to the M. Eng. may wish to obtain a Ph.D. To this end, we outline below the procedure that must be followed to effect such a change. At the outset, however, we stress that this option should not be used in an attempt to circumvent the normal Ph.D. admissions process. Students who fail to meet the standards for the Ph.D. program at the time of admission have little chance of being allowed into the Ph.D. program at a later date.

Students in the M. Eng. program wishing to be considered for admission to the Ph.D. program should consult their academic adviser as soon as possible. Transfer from M. Eng. to the Ph.D. program is possible provided that the student satisfies the following requirements:

- Satisfy all requirements for initial admission to the Ph.D program, including submission of GRE General Test Scores, and be approved for consideration for transfer to the Ph.D program by the ECE Graduate Curriculum Committee.
- Identify a faculty member who agrees, in writing, to serve as that student's academic and Ph.D. research adviser.
- In consultation with the academic adviser, design and complete a program of coursework that satisfies all course requirements and constraints for a Ph.D. discipline appropriate to their research. All students in the Ph.D. programs are required to satisfy all Ph.D. degree requirements as described below. Should the student not be admitted to the Ph.D. program, this program of coursework will serve, with the approval of the academic adviser and the ECE Graduate Curriculum Committee, to satisfy the coursework requirements for the M. Eng. degree.
- Pass the comprehensive examination (Ph.D. Preliminary) at the level required for continuation in the Ph.D. program. A student failing to pass the comprehensive exam at this required level will not be admitted to the Ph.D. program, and will instead continue in the M. Eng. degree program.
- Maintain a GPA of at least 3.4 in the appropriate core graduate courses.

A student who has fulfilled all of the above requirements should, after passing the departmental comprehensive exam, submit a petition to change their degree objective from M. Eng. to Ph.D.

Master of Science

The ECE department offers an M.S. programs in electrical and computer engineering. The M.S. program in computer engineering is jointly administered with the Department of Computer Science and Engineering. The M.S. programs are research oriented, are intended to provide the intensive technical preparation necessary for subsequent pursuit of a Ph.D. It is stressed that the M.S. degree is offered only to students who have been admitted to the Ph.D. program. The M.S. degree may be earned either with a thesis (Plan 1) or with a research project followed by a comprehensive examination (Plan 2). However, continuation in the Ph.D. program requires a comprehensive examination so most students opt for Plan 2.

Course Requirements:

The total course requirements for the master of science degrees in electrical engineering and in computer engineering are forty-eight units (twelve quarter courses) and forty-nine units, respectively, of which at least thirty-six units must be in graduate courses. Note that this is greater than the minimum requirements of the university. The department maintains a list of core courses for each disciplinary area from which the thirty-six graduate course units must be selected. The current list may be obtained from the department graduate office or the official Web site of the department. Students in interdisciplinary programs may select other core courses with the approval of their academic adviser. The course requirements must be completed within two years of full-time study. Students will be assigned a faculty adviser who will help select courses and approve their overall academic curriculum.

Scholarship Requirement: The forty-eight units of required course work must be taken for a letter grade (A-F), except for graduate research (e.g. ECE 298, 299) for which only S/U grades are allowed. Courses for which a D or F is received may not be counted. Students must maintain a GPA of 3.0 overall.

Thesis and Comprehensive Requirements: The department offers both M.S. Plan 1 (thesis) and M.S. Plan 2 (comprehensive exam). Students in the M.S. program may elect either Plan 1 or Plan 2 any time. Students in the M.S. Plan 1 (thesis) must take twelve units of ECE 299 (Research) and must submit a thesis as described in the

general requirements of the university. Students in the M.S. Plan 2 (comprehensive exam) must find a faculty member who will agree to supervise the student in a research project. This should be done before the start of the second year of study. They should complete at least four units of ECE 299 (Research) and must pass the departmental comprehensive examination by the end of their second year of study. This is an oral exam in which the student presents his or her research to a committee of three ECE faculty members, and is examined orally on a two-quarter core sequence in ECE. The outcome of the exam is based on the student's research presentation, proficiency demonstrated in the student's area of specialization, and overall academic record and performance in the graduate program.

Students in the computer engineering discipline may elect to take two written examinations in the Department of Computer Science and Engineering, in accordance with the CSE guidelines, in place of the oral examination on a two-quarter sequence in ECE. They are then required to give a thirty- to forty-five minute research presentation in the ECE department.

The Doctoral Programs

The ECE department offers graduate programs leading to the Ph.D. degree in ten disciplines within electrical and computer engineering, as described in detail below. The Ph.D. is a research degree requiring completion of the Ph.D. program course requirements, satisfactory performance on the comprehensive (Ph.D. Preliminary) examination and University Qualifying Examination, and submission and defense of a doctoral thesis (as described under the "Graduate Studies" section of this catalog). Students in the Ph.D. program must pass the comprehensive exam (Ph.D. Preliminary) before the beginning of the third year of graduate study. To ensure timely progress in their research, students are strongly encouraged to identify a faculty member willing to supervise their doctoral research by the end of their first year of study.

Students should begin defining and preparing for their thesis research as soon as they have passed the comprehensive exam (Ph.D. Preliminary). They should plan on taking the University Qualifying Examination about one year later. The University does not permit students to continue in graduate study for more than four years without passing this examination. At the Qualifying Examination the student will give an oral presentation of the thesis proposal to a campus-wide committee. The committee will decide if the proposal has adequate content and reasonable chance for success. They may require that the student modify the proposal and may require a further review.

The final Ph.D. requirements are the submission of a dissertation and the dissertation defense (as described under the "Graduate Studies" section of this catalog).

Course Requirements: The total course requirements for the Ph.D. degree in electrical engineering are forty-eight units (twelve quarter courses), of which at least thirty-six units must be in graduate courses. Note that this is greater than the minimum requirements of the university. The department maintains a list of core courses for each disciplinary area from which the thirty-six graduate course units must be selected. The current list may be obtained from the ECE department graduate office or the official Web site of the department. Students in the interdisciplinary programs may select other core courses with the approval of their academic adviser. The course requirements must be completed within two years of full-time study.

Students in the Ph.D programs may count no more than eight units of ECE 299 towards their course requirements.

Students who already hold an M.S. degree in electrical engineering must nevertheless satisfy the requirements for the core courses. However, graduate courses taken else where can be substituted for specific courses with the approval of the academic adviser.

Scholarship Requirement: The forty-eight units of required courses must be taken for a letter grade (A-F), except for eight units of ECE 299 (Research) for which only S/U grades are allowed. Courses for which a D or F is received may not be counted. Students must maintain a GPA of 3.0 overall. In addition, a GPA of 3.4 in the core graduate courses is generally expected.

Comprehensive Exam (Ph.D. Preliminary): Ph.D. students must find a faculty member who will agree to supervise their thesis research. This should be done before the start of the second year of study. They should then devote at least half their time to research and must pass the comprehensive examination (Ph.D. Preliminary) by the end of their second year of study.* This is an oral exam in which the student presents his or her research to a committee of three ECE faculty members, and is examined orally for proficiency in his or her area of specialization. The outcome of the exam is based on the student's research presentation, proficiency demonstrated in the student's area of specialization, and overall academic record and performance in the graduate program. Successful completion of the comprehensive examination (Ph.D. Preliminary) will also satisfy the M.S. Plan 2 comprehensive exam requirement.

* Students in the computer engineering discipline may elect to take two written examinations in the Department of Computer Science and Engineering, in accordance with the CSE guidelines, in place of the oral examination on a two-quarter sequence in ECE. They are then required to give a thirty to forty-five minute research presentation in the ECE department.

University Qualifying Exam: Students who have passed the comprehensive exam (Ph.D. Preliminary) should plan to take the University Qualifying Examination approximately a year after passing the comprehensive exam (Ph.D. Preliminary). The University does not permit students to continue in graduate study for more than four years without passing this examination. The University Qualifying Examination is an oral exam in which the student presents his or her thesis proposal to a university-wide committee. After passing this exam the student is "advanced to candidacy."

Dissertation Defense: The final Ph.D. requirements are the submission of a dissertation, and the dissertation defense (as described under the Graduate Studies section of this catalog). Students who are advanced to candidacy may register for any ECE course on an S/U basis.

Departmental Time Limits: Students who enter the Ph.D. program with an M.S. degree from another institution are expected to complete their Ph.D. requirements a year earlier than B.S. entrants. They must discuss their program with an academic adviser in their first quarter of residence. If their Ph.D. program overlaps significantly with their earlier M.S. work, the time limits for the comprehensive and qualifying exams will also be reduced by one year. Specific time limits for the Ph.D. program, assuming entry with a B.S. degree, are as follows:

1. **The Comprehensive Exam (Ph.D. Preliminary)** must be completed before the start of the third year of full-time study.
2. **The University Qualifying Exam** must be completed before the start of the fifth year of full-time study.

3. **Support Limit:** Students may not receive financial support through the University for more than seven years of full-time study (six years with an M.S. degree).
4. **Registered Time Limit:** Students may not register as graduate students for more than eight years of full-time study (seven years with an M.S. degree).

Half-Time Study: Time limits are extended by one quarter for every two quarters on approved half-time status. Students on half-time status may not take more than 6 units each quarter.

Ph.D. Research Programs:

1. **Applied Ocean Sciences:** This program in applied science related to the oceans is interdepartmental with the Graduate Department of the Scripps Institution of Oceanography (SIO) and the Department of Mechanical and Aerospace Engineering (MAE). It is administered by SIO. All aspects of man's purposeful and unusual intervention into the sea are included. The M.S. degree is not offered in this program.
2. **Applied Physics—Applied Optics and Photonics:** These programs encompass a broad range of interdisciplinary activities involving optical science and engineering, optical and optoelectronic materials and device technology, communications, computer engineering, and photonic systems engineering. Specific topics of interest include ultrafast optical processes, nonlinear optics, quantum cryptography and communications, optical image science, multidimensional optoelectronic I/O devices, spatial light modulators and photodetectors, artificial dielectrics, multifunctional diffractive and micro-optics, volume and computer-generated holography, optoelectronic and micromechanical devices and packaging, wave modulators and detectors, semiconductor-based optoelectronics, injection lasers, and photodetectors. Current research projects are focused on applications such as optical interconnects in high-speed digital systems, optical multidimensional signal and image processing, ultrahigh-speed optical networks, 3D optical memories and memory interfaces, 3D imaging and displays, and biophotonic systems. Facilities available for research in these areas include electron-beam and optical lithography, material growth, microfabrication, assembly, and packaging facilities, cw and femtosecond pulse laser systems, detection systems, optical and electro-optic components and devices, and electronic and optical characterization and testing equipment.
3. **Communication Theory and Systems** Communications theory and systems concerns the transmission, processing, and storage of information. Topics covered by the group include wireless and wireline communications, spread-spectrum communication, multi-user communication, network protocols, error-correcting codes for transmission and magnetic recording, data compression, time-series analysis, and image and voice processing.
4. **Computer Engineering** consists of balanced programs of studies in both hardware and software, the premise being that knowledge and skill in both areas are essential both for the modern-day computer engineer to make the proper unbiased trade-offs in design, and for researchers to consider all paths towards the solution of research questions and problems. Toward these ends, the programs emphasize studies (course work) and competency (comprehensive examinations, and dissertations or projects) in the areas of VLSI and logic design, and reliable computer and communication systems. Specific research areas include: computer systems, signal processing systems, multiprocessing and parallel and distributed computing, computer communications and networks, computer architecture, computer-aided design, fault-tolerance and reliability, and neurocomputing. The faculty is composed of interested members of the Departments of Electrical and Computer Engineering (ECE), Computer Science and Engineering (CSE), and related areas. The specialization is administered by both departments; the requirements are similar in both departments, with students taking the comprehensive exam, if necessary, given by the student's respective department.
5. **Electronic Circuits and Systems:** This program involves the study and design of analog, mixed-signal (combined analog and digital), and digital electronic circuits and systems. Emphasis is on the development, analysis, and implementation of integrated circuits that perform analog and digital signal processing for applications such as wireless and wireline communication systems, test and measurement systems, and interfaces between computers and sensors. Particular areas of study currently include radio frequency (RF) power amplifiers, RF low noise amplifiers, RF mixers, fractional-N phase-locked loops (PLLs) for modulated and continuous-wave frequency synthesis, pipelined analog-to-digital converters (ADCs), delta-sigma ADCs and digital-to-analog converters (DACs), PLLs for clock recovery, adaptive and fixed continuous-time, switched-capacitor, and digital filters, echo cancellation circuits, adaptive equalization circuits, wireless receiver and transmitter linearization circuits, mixed-signal baseband processing circuits for wireless transmitters and receivers, high-speed digital circuits, and high-speed clock distribution circuits.
6. **Applied Physics—Electronic Devices and Materials:** This program addresses the synthesis and characterization of advanced electronic materials, including semiconductors, metals, and dielectrics, and their application in novel electronic, optoelectronic, and photonic devices. Emphasis is placed on exploration of techniques for high-quality epitaxial growth of semiconductors, including both molecular-beam epitaxy (MBE) and metalorganic chemical vapor deposition (MOCVD); fabrication and characterization of materials and devices at the nanoscale; development of novel materials processing and integration techniques; and high-performance electronic devices based on both Group IV (Si/SiGe) and III-V compound semiconductor materials. Areas of current interest include novel materials and high-speed devices for wireless communications; electronic and optoelectronic devices for high-speed optical networks; high-power microwave-frequency devices; nanoscale CMOS devices and circuits; heterogeneous materials integration; novel device structures for biological and chemical sensing; advanced tools for nanoscale characterization and metrology; and novel nanoscale electronic, optoelectronic, and photonic devices. Extensive facilities are available for research in this area, including several MBE and MOCVD systems; a complete microfabrication facility; electron-beam lithography and associated process tools for nanoscale fabrication; a Rutherford backscattering system; x-ray diffractometers; electron microscopy facilities;

extensive scanning-probe instrumentation; cryogenic systems; and comprehensive facilities for DC to RF electrical device characterization and optical characterization of materials and devices.

7. **Intelligent Systems, Robotics, and Control:** This information sciences-based field is concerned with the design of human-interactive intelligent systems that can sense the world (defined as some specified domain of interest); represent or model the world; detect and identify states and events in the world; reason about and make decisions about the world; and/or act on the world, perhaps all in real-time. A sense of the type of systems and applications encountered in this discipline can be obtained by viewing the projects shown at the Web site http://swiftlet.ucsd.edu.

   The development of such sophisticated systems is necessarily an interdiscipinary activity. To sense and succinctly represent events in the world requires knowledge of signal processing, computer vision, information theory, coding theory, and data-basing; to detect and reason about states of the world utilizes concepts from statistical detection theory, hypothesis testing, pattern recognition, time series analysis, and artificial intelligence; to make good decisions about highly complex systems requires knowledge of traditional mathematical optimization theory and contemporary near-optimal approaches such as evolutionary computation; and to act upon the world requires familiarity with concepts of control theory and robotics. Very often learning and adaptation are required as either critical aspects of the world are poorly known at the outset, and must be refined online, or the world is non-stationary and our system must constantly adapt to it as it evolves. In addition to the theoretical information and computer science aspects, many important hardware and software issues must be addressed in order to obtain an effective fusion of a complicated suite of sensors, computers, and problem dynamics into one integrated system.

   Faculty affiliated with the ISRC subarea are involved in virtually all aspects of the field, including applications to intelligent communications systems; advanced human-computer interfacing; statistical signal- and image-processing; intelligent tracking and guidance systems; biomedical system identification and control; and control of teleoperated and autonomous multiagent robotic systems.

8. **Magnetic Recording** is an interdisciplinary field involving physics, material science, communications, and mechanical engineering. The physics of magnetic recording involves studying magnetic heads, recording media, and the process of transferring information between the heads and the medium. General areas of investigation include: nonlinear behavior of magnetic heads, very high frequency loss mechanisms in head materials, characterization of recording media by micromagnetic and many body interaction analysis, response of the medium to the application of spatially varying vectorial head fields, fundamental analysis of medium nonuniformities leading to media noise, and experimental studies of the channel transfer function emphasizing nonlinearities, interferences, and noise. Current projects include numerical simulations of high density digital recording in metallic thin films, micromagnetic analysis of magnetic reversal in individual magnetic particles, theory of recorded transition phase noise and magnetization induced nonlinear bit shift in thin metallic films, and analysis of the thermal-temporal stability of interacting fine particles.

   Research laboratories are housed in the Center for Magnetic Recording Research, a national center devoted to multi-disciplinary teaching and research in the field.

9. **Radio and Space Science:** The Radio Science Program focuses on the study of radio waves propagating through turbulent media. The primary objectives are probing of otherwise inaccessible media such as the solar wind and interstellar plasma. Techniques for removing the effects of the turbulent medium to restore the intrinsic signals are also studied.

   The Space Science Program is concerned with the nature of the sun, its ionized and supersonic outer atmosphere (the solar wind), and the interaction of the solar wind with various bodies in the solar system. Theoretical studies include: the interaction of the solar wind with the earth, planets, and comets; cosmic dusty-plasmas; waves in the ionosphere; and the physics of shocks. A major theoretical effort involves the use of supercomputers for modeling and simulation studies of both fluid and kinetic processes in space plasmas.

   Students in radio science will take measurements at various radio observatories in the U.S. and elsewhere. This work involves a great deal of digital signal processing and statistical analysis. All students will need to become familiar with electromagnetic theory, plasma physics, and numerical analysis.

10. **The Signal and Image Processing** Program explores engineering issues related to the modeling of signals starting from the physics of the problem, developing and evaluating algorithms for extracting the necessary information from the signal, and the implementation of these algorithms on electronic and opto-electronic systems. Specific research areas include filter design, fast transforms, adaptive filters, spectrum estimation and modeling, sensor array processing, image processing, motion estimation from images, and the implementation of signal processing algorithms using appropriate technologies with applications in sonar, radar, speech, geophysics, computer-aided tomography, image restoration, robotic vision, and pattern recognition.

Research Facilities

Most of the research laboratories of the department are associated with individual faculty members or small informal groups of faculty. Larger instruments and facilities, such as those for electron microscopy and e-beam lithography are operated jointly. In addition the department operates several research centers and participates in various university wide organized research units.

The department-operated research centers are the NSF Industrial/University Cooperative Research Center (I/UCRC) for Ultra-High Speed Integrated Circuits and Systems (ICAS); Opto-electronics Technology Center (OTC) sponsored by the Advanced Project Research Agency; the Center for Wireless Communications which is a university-industry partnership; the Center for Information Engineering; and the Institute for Neural Computation.

Department research is associated with the Center for Astronomy and Space Science, the Center for Magnetic Recording Research, the California Space Institute, and the Institute for Nonlinear Science. Departmental researchers also use various national and international laboratories, such as the National Nanofabrication Facility and the National Radio Astronomy Laboratory.

The department emphasizes computational capability and maintains numerous computer laboratories for instruction and research. One of the NSF national supercomputer centers is located on the campus. This is particularly useful for those whose work requires high data bandwidths.

COURSES

The department will endeavor to offer the courses as out lined below; however, unforeseen circumstances sometimes require a change of scheduled offerings. Students are strongly advised to check the *Schedule of Classes* or the department before relying on the schedule below. The names appearing below the course descriptions are those of faculty members in charge of the course. For the names of the instructors who will teach the course, please refer to the quarterly *Schedule of Classes*. The departmental Web site http://www.ece.ucsd.edut includes the present best estimate of the schedule of classes for the entire academic year.

LOWER-DIVISION

1A-B-C. Mesa Orientation Course (1-1-1)
Students will be given an introduction to the engineering profession and our undergraduate program. Exercises and practicums will develop the problem-solving skills needed to succeed in engineering. *Prerequisite: none.* (F,W,S)

20A. Introduction to Electrical Engineering I (4)
Areas of electrical engineering from Ohm's Law to semiconductor physics to engineering ethics are discussed, demonstrated, and experienced. Principles introduced in lectures are put to use as student lab teams build a working system. The first quarter emphasizes analog electronics. (Lab fee: $25) *Prerequisite: Math. 20A must be taken concurrently.* (F,W,S)

20B. Introduction to Electrical Engineering II (4)
This continuation of ECE 20A emphasizes semiconductor devices and digital electronics. Lab teams complete their system as they learn engineering design methods. Students are prepared for proceeding toward their choice of an electrical engineering profession. (Lab fee: $25) *Prerequisites: ECE 20A with a grade of C- or better.* (F,W,S)

30. Introduction to Computer Engineering (4)
The fundamentals of both the hardware and software in a computer system. Topics include: representation of information, computer organization and design, assembly and microprogramming, current technology in logic design. (Students who have taken CSE 30 may not take ECE 30 for credit.) *Prerequisite: ECE 20B and (CSE 11 or 8A-B) or MAE 9 with grades of C- or better.* (F,S)

53A. Fundamentals of Electrical Engineering I (4)
This is a coordinated lecture and laboratory course for students majoring in other branches of science and engineering. It covers analysis and design of passive and active circuits. The course emphasizes problem-solving and laboratory work on passive circuits. *Prerequisites: Math. 21C, Math. 21D must be concurrent, Phys. 2B or BS or 4C with grades of C– or better.* (F,W)

53B. Fundamentals of Electrical Engineering II (4)
This is a coordinated lecture and laboratory course for students majoring in other branches of science and engineering. It covers analog and digital systems and active circuit design. Laboratory work will include operational amplifiers, diodes and transistors. *Prerequisites: ECE 53A with a grade of C– or better.* (W,S)

60A. Circuits and Systems I (4)
Voltage-current relationships for circuit elements, Kirchhoff's voltage and current laws, source transformations, loop and node analysis, initial conditions, the Laplace transform, inverse transforms, partial fraction expansions. *Prerequisites: Math 20B, 21C, 21D, and ECE 20A with grades of C- or better.* (F,W)

60B. Circuits and Systems II (4)
Solution of network equations using Laplace transforms; convolution integral; the concept of impedance; Thevenin's and Norton's theorems; transfer functions; poles and zeros; two-port networks, steady state sinusoidal response; Bode plots. *Prerequisite: ECE 60A and Math. 21D with grades of C– or better.* (W,S)

60L. Circuits and Systems Laboratory (4)
In this course, students learn to model, simulate, and design practical circuits using idealized circuit models to account for the interactions among various parts of a circuit, the concept of feedback, etc. Topics include first and second order filters, operational amplifiers (linear amplifiers, active filters, differentiators, integrators, comparators, triggers, oscillators), and transistor circuits (amplifiers, digital circuits). (Lab fee: $15) *Prerequisites: ECE 60A with a grade of C– or better. ECE 60B must be taken concurrently or already completed with a grade of C– or better.* (W,S)

87. Freshman Seminar (1)
The freshman seminar program is designed to provide new students with the opportunity to explore an intellectual topic with a faculty member in a small seminar setting. Freshman seminars are offered in all campus departments and undergraduate colleges, and topics vary from quarter to quarter. Enrollment is limited to 15 to 20 students, with preference given to entering freshmen. *Prerequisite: none.*

90. Undergraduate Seminar (1)
This seminar class will provide a broad review of current research topics in both electrical engineering and computer engineering. Typical subject areas are signal processing, VLSI design, electronic materials and devices, radio astronomy, communications, and optical computing. *Prerequisite: none.* (F,W,S)

UPPER-DIVISION

101. Linear Systems Fundamentals (4)
Complex variables. Singularities and residues. Signal and system analysis in continuous and discrete time. Fourier series and transforms. Laplace and z-transforms. Linear Time Invariant Systems. Impulse response, frequency response, and transfer functions. Poles and zeros. Stability. Convolution. Sampling. Aliasing. *Prerequisites: ECE 60B or ECE 53B with grades of C– or better.* (F,W)

102. Introduction to Active Circuit Design (4)
Nonlinear active circuits design. Nonlinear device models for diodes, bipolar and field-effect transistors. Linearization of device models and small signal equivalent circuits. Circuit designs will be simulated by computer and tested in the laboratory. (Lab fee: $15) *Prerequisites: ECE 60B and 60L or ECE 53B with grades of C– or better.* (F,W)

103. Fundamentals of Devices and Materials (4)
Introduction to semiconductor materials and devices. Semiconductor crystal structure, energy bands, doping, carrier statistics, drift and diffusion. p-n junctions, metal-semiconductor junctions. Bipolar junction transistors: current flow, amplification, switching, nonideal behavior Metal-oxide-semiconductor structures, MOSFETs, device scaling. *Prerequisites: Phys. 2D or Phys. 4D and 4E with grades of C– or better.* (F,W)

107. Electromagnetism (4)
Electrostatics and magnetostatics; electrodynamics; Maxwell's equations; plane waves; skin effect. Electromagnetics of transmission lines: reflection and transmission at discontinuities, Smith chart, pulse propagation, dispersion. Rectangular waveguides. Dielectric and magnetic properties of materials. Electromagnetics of circuits. *Prerequisites: Phys. 2A-D or 4A-E and ECE 60B or 53B with grades of C– or better.* (F,W)

108. Digital Circuits (4)
Digital integrated electronic circuits for processing technologies. Analytical methods for static and dynamic characteristics. MOS field-effect transistors and bipolar junction transistors, circuits for logic gates, flip-flop, data paths, programmable logic arrays, memory elements. (Lab fee: $15) *Prerequisites: Math 20A-B, 21C-D, 20F-E; Phys. 2A-D or 4A-E; (ECE 20A-B, 30, ECE 60A-B-L) or (ECE 53A and 53B); ECE 30 or CSE 30; ECE 102 with grades of C– or better.* (W,S)

109. Engineering Probability and Statistics (4)
Axioms of probability, conditional probability, theorem of total probability, random variables, densities, expected values, characteristic functions, transformation of random variables, central limit theorem. Random number generation, engineering reliability, elements of estimation, random sampling, sampling distributions, tests for hypothesis. Students who completed Math. 180A-B, Math. 183, or Economics 120A will not receive credit for ECE 109. *Prerequisites: Math. 20A-B-C or 21C, 20D or 21D, 20F, with grades of C– or better. (ECE 101 recommended).* (F,W,S)

111. Advanced Digital Design Project (4)
Advanced topics in digital circuits and systems. Use of computers and design automation tools. Hazard elimination, synchronous/asnychronous FSM synthesis, synchronization and arbitration, pipelining and timing issues. Problem sets and design exercises. A large-scale design project. Simulation and/or rapid prototyping. *Prerequisite: ECE 108 or CSE 140 with grades of C– or better.* (F,W,S)

118. Computer Interfacing (4)
Interfacing computers and embedded controllers to the real world: busses, interrupts, DMA, memory mapping, concurrency, digital I/O, standards for serial and parallel communications, A/D, D/A, sensors, signal conditioning, video, and closed loop control. Students design and construct an interfacing project. (Lab fee: $20) *Prerequisites: ECE 30 or CSE 30 and ECE 60A-B-L or ECE 53A-B.* (S)

120. Solar System Physics (4)
General introduction to planetary bodies, the overall structure of the solar system, and space plasma physics. Course emphasis will be on the solar atmosphere, how the solar wind is produced, and its interaction with both magnetized and unmagnitized planets (and comets). *Prerequisites: Phys. 2A-C or 4A-D, Math. 20A-B, 20C or 21C with grades of C- or better.* (S)

123. Antenna Systems Engineering (4)
The electromagnetic and systems engineering of radio antennas for terrestrial wireless and satellite communications. Antenna impedance, beam pattern, gain, and polarization. Dipoles, monopoles, paraboloids, phased arrays. Power and noise budgets for communication links. Atmospheric propagation and multipath. *Prerequisite: ECE 107 with a grade of C- or better.* (F)

134. Electronic Materials Science of Integrated Circuits (4)
Electronic materials science with emphasis on topics pertinent to microelectronics and VLSI technology. Concept of the course is to use components in integrated circuits to discuss structure, thermodynamics, reaction kinetics, and electrical properties of materials. *Prerequisites: Phys. 2C-D with grades of C- or better.* (S)

135A. Semiconductor Physics (4)
Crystal structure and quantum theory of solids; electronic band structure; review of carrier statistics, drift and diffusion, p-n junctions; nonequilibrium carriers, imrefs, traps, recombination, etc; metal-semiconductor junctions and heterojunctions. *Prerequisite: ECE 103 with a grade of C- or better.* (F)

135B. Electronic Devices (4)
Structure and operation of bipolar junction transistors, junction field-effect transistors, metal-oxide-semiconductor diodes and transistors. Analysis of dc and ac characteristics. Charge control model of dynamic behavior. *Prerequisite: ECE 135A with a grade of C- or better.* (W)

136. Fundamentals of Semiconductor Device Fabrication (4)
Crystal growth, controlled diffusion, determination of junction-depth and impurity profile, epitaxy, ion-implantation, oxidation, lithography, chemical vapor deposition, etching, process simulation and robust design for fabrication. *Prerequisite: ECE 103 with a grade of C- or better.* (S)

136L. Microelectronics Laboratory (4)
Laboratory fabrication of diodes and field effect transistors covering photolithography, oxidation, diffusion, thin film deposition, etching and evaluation of devices. (Lab fee: $35) *Prerequisite: ECE 103 with a grade of C- or better.* (F,S)

138L. Microstructuring Processing Technology Laboratory (4)
A laboratory course covering the concept and practice of microstructuring science and technology in fabricating devices relevant to sensors, lab-chips and related devices. (Lab fee: $40) *Prerequisite: upper-division standing for science and engineering students.* (W)

139. Semiconductor Device Design and Modeling (4)
Device physics of modern field effect transistors and bipolar transistors, including behavior of submicron structures. Relationship between structure and circuit models of transistors. CMOS and BiCMOS technologies. Emphasis on computer simulation of transistor operation and application in integrated circuits. *Prerequisites: ECE 135A-B with grades of C- or better.* (S)

145AL-BL-CL. Acoustics Laboratory (4-4-4)
Automated laboratory based on H-P GPIB controlled instruments. Software controlled data collection and analysis. Vibrations and waves in strings and bars of electromechanical systems and transducers. Transmissions, reflection, and scattering of sound waves in air and water. Aural and visual detection. *Prerequisite: ECE 107 with a grade of C- or better or consent of instructor.* (F-W-S)

146. Introduction to Magnetic Recording (4)
A laboratory introduction to the writing and reading of digital information in a disk drive. Basic magnetic recording measurements on state-of-art disk drives to evaluate signals, noise, erasure, and non-linearities that characterize this channel. Lectures on the recording process will allow comparison of measurements with basic voltage expressions. E/M FEM software utilized to study geometric effects on the record and play transducers. *Prerequisite: ECE 107 with a grade of C- or better.* (W)

153. Probability and Random Processes for Engineers (4)
Random processes. Stationary processes: correlation, power spectral density. Gaussian processes and linear transformation of Gaussian processes. Point processes. Random noise in linear systems. *Prerequisite: ECE 109 with a grade of C- or better.* (F,S)

154A. Communications Systems I (4)
Study of analog modulation systems including AM, SSB, DSB, VSB, FM, and PM. Performance analysis of both coherent and noncoherent receivers, including threshold effects in FM. *Prerequisite: ECE 101 and 153 with a grade of C- or better.* (F)

154B. Communications Systems II (4)
Design and performance analysis of digital modulation techniques, including probability of error results for PSK, DPSK, and FSK. Introduction to effects of intersymbol interference and fading. Detection and estimation theory, including optimal receiver design and maximum-likelihood parameter estimation. *Prerequisite: ECE 154A with a grade of C- or better.* (W)

154C. Communications Systems III (4)
Introduction to information theory and coding, including entropy, average mutual information, channel capacity, block codes and convolutional codes. *Prere-quisite: ECE 154B with a grade of C- or better.* (S)

155A. Digital Recording Systems (4)
This course will be concerned with modulation and coding techniques for digital recording channels. *Prerequisites: ECE 109 and 153 with grades of C- or better and concurrent registration in ECE 154A required. Department stamp required.* (F)

155B-C. Digital Recording Projects (4-4)
These courses will be concerned with modulation and coding techniques for digital recording channels. In winter and spring quarters, students will perform experiments and/or computer simulations. *Prerequisites: ECE 109 and 153 with grades of C- or better and concurrent registration in ECE 154B-C required. Department stamp required.* (W,S)

156 Sensor Networks (4)
Characteristics of chemical, biological, seismic, and other physical sensors; signal processing techniques supporting distributed detection of salient events; wireless communication and networking protocols supporting formation of robust sensor fabrics; current experience with low power, low cost sensor deployments. Undergraduate students must take a final exam; graduate students must write a term paper or complete a final project. Cross-listed with MAE 149 and SIO 238. *Prerequisite: upper-division standing and consent of instructor, or graduate student in science and engineering.*

158A. Data Networks I (4)
Layered network architectures, data link control protocols and multiple-access systems, performance analysis. Flow control; prevention of deadlock and throughput degradation. Routing, centralized and decentralized schemes, static dynamic algorithms. Shortest path and minimum average delay algorithms. Comparisons. *Prerequisite: ECE 109 with a grade of C- or better. ECE 159A recommended.* (W)

158B. Data Networks II (4)
Layered network architectures, data link control protocols and multiple-access systems, performance analysis. Flow control; prevention of deadlock and throughput degradation. Routing, centralized and decentralized schemes, static dynamic algorithms. Shortest path and minimum average delay algorithms. Comparisons. *Prerequisite: ECE 158A with a grade of C- or better.* (S)

159A. Queuing Systems: Fundamentals (4)
Analysis of single and multiserver queuing systems; queue size and waiting times. Modeling of telephone systems, interactive computer systems and the machine repair problems. *Prerequisite: ECE 109 with a grade of C- or better.* (F)

159B. Queuing Systems: Computer Systems and Data Networks (4)
M/G/1 queuing systems. Computer systems applications: priority scheduling; time-sharing scheduling. Open and closed queuing networks; modeling and performance of interactive computer systems. Elements of computer-communication networks: stability and delay analysis; optimal design issues. *Prerequisite: ECE 159A with a grade of C- or better.* (W)

161A. Introduction to Digital Signal Processing (4)
Review of discrete-time systems and signals, Discrete-Time Fourier Transform and its properties, the Fast Fourier Transform, design of Finite Impulse Response (FIR) and Infinite Impulse Response (IIR) filters, implementation of digital filters. *Prerequisite: ECE 101 and 109 with grades of C- or better.* (F,S)

161B. Digital Signal Processing I (4)
Sampling and quantization of baseband signals; A/D and D/A conversion, quantization noise, oversampling and noise shaping. Sampling of bandpass signals, undersampling downconversion, and Hilbert transforms. Coefficient quantization, roundoff noise, limit cycles and overflow oscillations. Insensitive filter structures, lattice and wave digital filters. Systems will be designed and tested with Matlab, implemented with DSP procesors and tested in the laboratory. (Lab fee: $15) *Prerequisite: ECE 161A with a grade of C- or better.* (W)

161C. Applications of Digital Signal Processing (4)
This course discusses several applications of DSP. Topics covered will include: speech analysis and coding; image and video compression and processing. A class project is required, algorithms simulated by MATLAB. (Lab fee: $15) *Prerequisite: ECE 161A with a grade of C- or better.* (S)

163. Electronic Circuits and Systems (4)
Analysis and design of analog circuits and systems. Feedback systems with applications to operational amplifier circuits. Stability, sensitivity, bandwidth, compensation. Design of active filters. Switched capacitor circuits. Phase-locked loops. Analog-to-digital and digital-to-analog conversion. (Lab fee: $10) *Prerequisites: ECE 101 and 102 with grades of C– or better.* (S)

164. Analog Integrated Circuit Design (4)
Design of linear and non-linear analog integrated circuits including operational amplifiers, voltage regulators, drivers, power stages, oscillators, and multipliers. Use of feedback and evaluation of noise performance. Parasitic effects of integrated circuit technology. Laboratory simulation and testing of circuits. *Prerequisite: ECE 102 with a grade of C– or better. ECE 163 recommended.* (F)

165. Digital Integrated Circuit Design (4)
VLSI digital systems. Circuit characterization, performance estimation, and optimization. Circuits for alternative logic styles and clocking schemes. Subsystems include ALUs, memory, processor arrays, and PLAs. Techniques for gate arrays, standard cell, and custom design. Design and simulation using CAD tools. (Students who have taken CSE 143 may not take ECE 165 for credit.) *Prerequisite: ECE 108 with a grade of C– or better.* (W)

166. Microwave Systems and Circuits (4)
Waves, distributed circuits, and scattering matrix-methods. Passive microwave elements. Impedance matching. Detection and frequency conversion using microwave diodes. Design of transistor amplifiers including noise performance. Circuits designs will be simulated by computer and tested in the laboratory. *Prerequisites: ECE 102 and 107 with grades of C– or better.* (S)

171A. Linear Control System Theory (4)
Stability of continous- and discrete-time single-input/single-output linear time-invariant control systems emphasizing frequency domain methods. Transient and steady-state behavior. Stability analysis by root locus, Bode, Nyquist, and Nichols plots. Compensator design. *Prerequisite: ECE 60B or ECE 53A-B or MAE 140 with a grade of C– or better.* (S)

171B. Linear Control System Theory (4)
Time-domain, state-variable formulation of the control problem for both discrete-time and continous-time linear systems. State-space realizations from transfer function system description. Internal and input-output stability, controllability/observability, minimal realizations, and pole-placement by full-state feedback. *Prerequisite: ECE 171A with a grade of C– or better.* (F)

172A. Introduction to Intelligent Systems: Robotics and Machine Intelligence (4)
This course will introduce basic concepts in machine perception. Topics covered will include: edge detection, segmentation, texture analysis, image registration, and compression. *Prerequisite: ECE 101 with a grade of C– or better, ECE 109 recommended.* (F)

173. Theory and Applications of Neural Networks and Fuzzy Logic (4)
Theory of fuzzy logic, reasoning and control; mathematical aspects of neural architectures for pattern classification, functional approximation, and adaptive estimation and control; theory of computer-assisted learning (supervised, unsupervised and hybrid); theory and practice of recurrent networks (stability, placement of equilibria); computer-aided design of fuzzy and neural systems, Bayes and minimax design. *Prerequisite: Math. 20F with a grade of C– or better.* (S)

174. Introduction to Linear and Nonlinear Optimization with Applications (4)
The linear least squares problem, including constrained and unconstrained quadratic optimization and the relationship to the geometry of linear transformations. Introduction to nonlinear optimization. Applications to signal processing, system identification, robotics, and circuit design. *Prerequisite: Math. 20F with a grade of C– or better.* (S)

175. Elements of Machine Intelligence: Pattern Recognition and Machine Learning (4)
Decision functions. Pattern classification by distance and likelihood functions; deterministic and statistical trainable pattern classifiers; feature selection; issues in machine learning. *Prerequisites: ECE 109 and ECE 174 with grades of C– or better.* (W)

181. Physical Optics and Fourier Optics (4)
Ray optics, wave optics, beam optics, Fourier optics, and electromagnetic optics. Ray transfer matrix, matrices of cascaded optics, numerical apertures of step and graded index fibers. Fresnel and Fraunhofer diffractions, interference of waves. Gaussian and Bessel beams, the ABCD law for transmissions through arbitrary optical systems. Spatial frequency, impulse response and transfer function of optical systems, Fourier transform and imaging properties of lenses, holography. Wave propagation in various (inhomogeneous, dispersive, anisotropic or nonlinear) media. *Prerequisites: ECE 103 and 107 with grades of C– or better.* (S)

182. Electromagnetic Optics, Guided-wave, and Fiber Optics (4)
Polarization optics: crystal optics, birefringence. Guided-wave optics: modes, losses, dispersion, coupling, switching. Fiber optics: step and graded index, single and multimode operation, attenuation, dispersion, fiber optic communications. Resonator optics. *Prerequisites: ECE 103 and 107 with grades of C– or better.* (F)

183. Optical Electronics (4)
Quantum electronics, interaction of light and matter in atomic systems, semiconductors. Laser amplifiers and laser systems. Photodetection. Electrooptics and acoustooptics, photonic switching. Fiber optic communication systems. Labs: semiconductor lasers, semiconductor photodetectors. (Lab fee: $35) *Prerequisites: ECE 103 and 107 with grades of C– or better.* (S)

184. Optical Information Processing and Holography (4)
Labs: optical holography, photorefractive effect, spatial filtering, computer generated holography. (Lab fee: $35) *Prerequisite: ECE 182 with a grade of C– or better.* (W)

185. Lasers and Modulators (4)
Labs: CO2 laser, HeNe laser, electrooptic modulation, acoustooptic modulation, spatial light modulators. (Lab fee: $35) *Prerequisite: ECE 183 with a grade of C– or better.* (S)

186L. Optical Information Systems (4)
Lab covering concepts in optical data systems including free-space communications, remote sensing and wavelength-multiplexed optical fiber transmission. (Lab fee: $35.00) *Prerequisites: ECE 181 and 182 or 183 with grades of C– or better, or consent of instructor.*

187. Introduction to Biomedical Imaging and Sensing (4)
Image processing fundamentals: imaging theory, image processing, pattern recognition; digital radiography, computerized tomography, nuclear medicine imaging, nuclear magnetic resonance imaging, ultrasound imaging, microscopy imaging. *Prerequisite: Math. 20A-B-F, 20C or 21C, 20D or 21D, Phys. 2A-D, ECE 101 (may be taken concurrently) with grades of C– or better.* (F)

191. Engineering Group Design Project (4)
Groups of students work to design, build, demonstrate, and document an engineering project. All students give weekly progress reports of their tasks and contribute a section to the final project report. *Prerequisites: Completion of all of the breadth courses and one depth course.* (W)

192. Engineering Design (4)
Students complete a project comprising at least 50 percent or more engineering design to satisfy the following features: student creativity, open-ended formulation of a problem statement/specifications, consideration of alternative solutions/realistic constraints. Written final report required. *Prerequisites: Students enrolling in this course must have completed all of the breadth courses and one depth course. The department stamp is required to enroll in ECE 192.* (Specifications and enrollment forms are available in the undergraduate office.)

193H. Honors Project (4-8)
An advanced reading or research project performed under the direction of an ECE faculty member. Must contain enough design to satisfy the ECE program's four-unit design requirement. Must be taken for a letter grade. May extend over two quarters with a grade assigned at completion for both quarters. *Prerequisite: admission to the ECE departmental honors program.*

195. Teaching (2 or 4)
Teaching and tutorial activities associated with courses and seminars. Not more than four units of ECE 195 may be used for satisfying graduation requirements. (P/NP grades only.) *Prerequisite: consent of the department chair.*

197. Field Study in Electrical and Computer Engineering (4, 8, 12, or 16)
Directed study and research at laboratories and observatories away from the campus. (P/NP grades only.) *Prerequisites: consent of instructor and approval of the department.*

198. Directed Group Study (2 or 4)
Topics in electrical and computer engineering whose study involves reading and discussion by a small group of students under direction of a faculty member. (P/NP grades only.) *Prerequisite: consent of instructor.*

199. Independent Study for Undergraduates (2 or 4)
Independent reading or research by special arrangement with a faculty member. (P/NP grades only.) *Prerequisite: consent of instructor.*

GRADUATE

200. Research Conference (2)
Group discussion of research activities and progress of group members. (S/U grades only.) *Prerequisite: consent of instructor.* (F,W,S)

210. Information Systems in Manufacturing (4)
Basic problem solving and search techniques. Knowledge based and expert systems. Planning and decision support systems. Fuzzy logic and neural nets. Topics covered will include data models, query processing, distributed systems, enterprise computing and intelligent agents, fuzzy logic, neural nets. *Prerequisite: basic engineering and introduction to computers.* (W)

211. Manufacturing Engineering Seminar and Laboratory (2)
Combination of seminars, laboratory activities, and field trips. Seminars by top manufacturing engineers, managers, and student interns. Visits to manufacturing facilities. Techniques in accessing international technical and patent databases. *Prerequisite: none..*

222A-B-C. Applied Electromagnetic Theory (4)
Electrostatics and dielectric materials. Uniqueness, reciprocity, and Poynting theorems. Solutions to Maxwell's equations in rectangular, cylindrical, and spherical coordinates. Waves in isotropic and anisotropic media, transmission lines, wave-guides, optical fibers, and resonant structures. Radiation, propagation, and scattering problems. Scattering matrices, microwave circuits, and antennas. *Prerequisites: ECE 107, 123, 124 or equivalent.* (F,W,S)

223. Nonlinear Waves with Dispersion (4)
This course explores nonlinear wave phenomena developing in a dispersive media. We shall investigate such phenomena as formation of solitons, collisionless shocks, nonlinear self focusing, and wave collapse. Analysis will be based on the solution of the main equations of nonlinear physics—Kortveg de Vries (KDV), Burgers, and nonlinear Schrodinger equation. Possible areas of application include nonlinear optics, fluid dynamics, plasma and space physics. *Prerequisite: ECE 222A or PHYS 203A or equivalent.* (S)

230A. Solid State Electronics (4)
This course is designed to provide a general background in solid state electronic materials and devices. Course content emphasizes the fundamental and current issues of semiconductor physics related to the ECE solid state electronics sequences. *Prerequisites: fundamentals of quantum mechanics, ECE 135A-B, or equivalent.* (F)

230B. Solid State Electronics (4)
Physics of solid-state electronic devices, including p-n diodes, Schottky diodes, field-effect transistors, bipolar transistors, pnpn structures. Computer simulation of devices, scaling characteristics, high frequency performance, and circuit models. *Prerequisite: ECE 230A.* (W)

230C. Solid State Electronics (4)
This course is designed to provide a treatise of semiconductor devices based on solid state phenomena. Band structures carrier scattering and recombination processes and their influence on transport properties will be emphasized. *Prerequisite: ECE 230A or equivalent.* (S)

232. The Field Effect and Field Effect Transistors (4)
Physics of the field effect of elemental and III-V compound semiconductors related to the technology and characteristics of Schottky barrier gate, insulated gate, and junction gate field effect transistors. *Prerequisite: consent of instructor.* (S)

234A. Imperfections in Solids (4)
Point, line, and planar defects in crystalline solids, including vacancies, self-interstitials, solute atoms, dislocation interactions, stacking faults, grain boundaries, and their effects on the properties of solids. Hardening by localized obstacles, precipitates, and dispersoids. Cross-listed with MAE 272 and MATS 205A. *Prerequisite: consent of instructor.* (F)

234B. Advanced Study of Defects in Solids (4)
Advanced topics in dislocation theory and dislocation dynamics. Defects and defects interactions. Atomistic and subatomistic effects. Physical models based on microscopic considerations. Cross-listed with MATS 205B. *Prerequisite: ECE 234A or consent of instructor.* (W)

235. Nanometer-Scale VLSI Devices (4)
This course covers modern research topics in sub-100 nm scale, state-of-the-art silicon VLSI devices. Starting with the fundamentals of CMOS scaling to nanometer dimensions, various advanced device and circuit concepts, including RF CMOS, low power CMOS, silicon memory, silicon-on-insulator, SiGe bipolar, strained silicon MOSFET's, etc. will be taught. The physics of near-ballistic transport in an ultimately scaled 10 nm MOSFET will be discussed in light of the recently developed scattering theory. *Prerequisite: graduate standing.* (F)

236A. Semiconductor Heterostructure Materials (4)
This course covers the growth, characterization, and heterojunction properties of III-IV compound semiconductors and group-IV semiconductor heterostructures for the subsequent courses on electronic and photonic device applications. Topics include epitaxial growth techniques, electrical properties of heterojunctions, transport and optical properties of quantum wells and superlattices. *Prerequisites: ECE 230A-B-C or consent of instructor.* (W)

236B. Optical Processes in Semiconductors (4)
Absorption and emission of radiation in semiconductors. Radiative transition and nonradiative recombination. Ultra-fast optical phenomena. Laser and photodetector devices will be emphasized. *Prerequisites: ECE 230A and 230C or equivalent.* (W)

236C. Heterojunction Field Effect Transistors (4)
Device physics and applications of isotype and anisotype heterojunctions and quantum wells, including band-edge discontinuities, band bending and space charge layers at heterojunction interfaces, charge transport normal and parallel to such interfaces, two-dimensional electron gas structures, modulation doping, heterojunction and insulated gate field effect transistors. *Prerequisite: consent of instructor.* (S)

236D. Heterojunction Bipolar Transistors (4)
Current flow and charge storage in bipolar transistors. Use of heterojunctions to improve bipolar structures. Transient electron velocity overshoot. Simulation of device characteristics. Circuit models of HBTs. Requirements for high-speed circuit applications. Elements of bipolar process technology, with emphasis on III-V materials. *Prerequisite: consent of instructor.* (F)

237. Modern Materials Analysis (4)
Analysis of the near surface of materials via ion, electron, and x-ray spectroscopes. Topics to be covered include particle solid interactions. Rutherford backscattering, secondary ion mass spectroscopy, electron energy loss spectroscopy, particle induced x-ray emission, Auger electron spectroscopy, extended z-ray absorption, fine structure and channeling. *Prerequisite: consent of instructor.* (F)

238A. Thermodynamics of Solids (4)
The thermodynamics and statistical mechanics of solids. Basic concepts, equilibrium properties of alloy systems, thermodynamic information from phase diagrams, surfaces and interfaces, crystalline defects. Multiple listed with Materials Science 201A. *Prerequisite: consent of instructor.* (F)

238B. Solid State Diffusion and Reaction Kinetics (4)
Thermally activated processes. Boltzman factor, homogeneous and heterogeneous reactions, solid state diffusion, Fick's law, diffusion mechanisms, Kirkendall effects, Boltzmann-Manato analysis, high diffusivity paths. Multiple listed with Materials Science 201B. *Prerequisite: ECE 238A.* (W)

240A. Lasers and Optics (4)
Fresnel and Fraunhofer diffraction theory. Optical resonators, interferometry. Gaussian beam propagation and transformation. Laser oscillation and amplification, Q-switching and mode locking of lasers, some specific laser systems. *Prerequisites: ECE 123, 124 or equivalent; introductory quantum mechanics or ECE183.* (F)

240B. Optical Information Processing (4)
Space-bandwidth product, superresolution, space-variant optical system, partial coherence, image processing with coherent and incoherent light, processing with feedback, real-time light modulators for hybrid processing, nonlinear processing. Optical computing and other applications. *Prerequisite: ECE 182 or equivalent.* (W)

240C. Optical Modulation and Detection (4)
Propagation of waves and rays in anisotropic media. Electro-optical switching and modulation. Acousto-optical deflection and modulation. Detection theory. Heterodyne detection, incoherent and coherent detection. *Prerequisites: ECE 181,183 or equivalent.* (S)

241A. Nonlinear Optics (4)
Second harmonic generation (color conversion), parametric amplification and oscillation, photorefractive effects and four-wave mixing, optical bistability; applications. *Prerequisites: ECE 240A, C, or consent of instructor.* (F)

241B. Optical Devices for Computing. (4)
Application of electro-optic, magneto-optic, acousto-optic, and electro-absorption effects to the design of photonic devices with emphasis on spatial light modulation and optical storage techniques. *Prerequisites: ECE 240A, C, or consent of instructor.* (F)

241C. Holographic Optical Elements (4)
Fresnel, Fraunhofer, and Fourier holography. Analysis of thin and volume holograms, reflection and transmission holograms, color and polarization holograms. Optically recorded and computer-generated holography. Applications to information storage, optical interconnects, 2-D and 3-D display, pattern recognition, and image processing. *Prerequisite: ECE 182 or equivalent, or consent of instructor.* (W)

241AL. Lasers and Holography Laboratory (2)
Laser resonator design, construction, alignment, characterizations. Operation and evaluation of molecular, gas, liquid dye, semiconductor lasers. Spatial and temporal coherance measurements. Design and fabrication of transmission, reflection, bleached, color, multiple exposure holograms. *Prerequisites: ECE 181,182,183 or consent of instructor. (This course is cojoint with ECE 184. Graduate students will choose 50 percent of the experiments and receive two units of credit.)* (F)

241BL. Optical Signal Processing Laboratory (2)
Construction and characterization of Fourier/Fresnel transform, coherent/incoherent, imaging-processing systems. Design, coding, fabrication of spatial filters, computer-generated holograms. Experiments in nonlinear photorefractive phenomena and image-processing applications. Construction of vector-matrix multipliers. Optical systems design using Code-V. *Prerequisites: ECE 181, 182, 183, or consent of instructor. (This course is cojoint with ECE 185. Graduate stduents will choose 50 percent of the experiments and receive two units of credit.)* (W)

241CL. Optoelectronics and Communications laboratory (2)
Operation and characterization of electro-optic, acousto-optic modulators. Polarization manipulation techniques. Heterodyne detection schemes. Parametrization of P-I-N and avalanche detectors, LED sources. Evaluation of optical fiber, thin film waveguide properties. Characterization of Hughes LCLV spatial light modulator. *Prerequisites: ECE 181, 182, 183, or consent of instructor.*

243B. Optical Fiber Communication (4)
Optical fibers, waveguides, laser communication system., Modulation and demodulation; detection processes and communication-receivers. *Prerequisites: ECE 240A or 240B or 240C or equivalent.* (W)

244A. Statistical Optics (4)
Introduction to statistical phenomena in optics including first order properties of light waves generated from various sources. Coherence of optical waves, high-order coherence. Partial coherence and its effects on imaging systems. Imaging in presence of randomly inhomogeneous medium. Limits in photelectric detection of light. *Prerequisite: ECE 240A-B or consent of instructor.* (F)

244B. Quantum Electronics of Femtosecond Optical Pulses (4)
Femtosecond optical pulses in linear dispersive media. Self-action of optical pulses. Parametric interaction of optical pulses. Self- and cross-phase modulation. Fast phase control, compression and shaping of optical pulses. Optical solitons. Applications of femtosecond optical pulses. *Prerequisite: ECE 240A-B-C or consent of instructor.* (W)

245A. Advanced Acoustics I (4)
Boundary value problems in vibrating systems, wave propagation in strings, bars, and plates. Fundamentals of acoustical transducers. *Prerequisite: concurrent registration in ECE 145AL recommended.* (F)

245B. Advanced Acoustics II (4)
Theory of radiation transmission and scattering of sound with special application to ocean acoustics. *Prerequisite: ECE 245A or consent of instructor. Concurrent registration in ECE 145BL recommended.* (W)

245C. Advanced Acoustics III (4)
Signal processing in underwater acoustics. Theory and hardwave embodiments. *Prerequisite: ECE 245B or consent of instructor. Concurrent registration in ECE 145CL recommended.* (S)

246A. Materials for Magnetic Recording (4)
Properties of magnetic materials utilized as magnetic recording media and heads; magnetic structure of oxides and metals; fine particle magnetism: micromagnetic analysis; hysteresis and reversal mechanisms of hard materials; dynamic processes and domain patterns of soft materials; thermal fluctuations; multilayer phenomena: giant magnetoresistance. *Prerequisites: undergraduate electromagnetism and solid state physics or consent of instructor.* (alternate years)

246B. Analysis of the Magnetic Recording Process (4)
In-depth analysis of the magnetic recording process. Magnetic fields and Fourier transforms of fields and magnetized media and heads; playback process for single and multiple transitions. Reciprocity theorem for inductive and magnetoresistive heads; record process modeling; interferences and nonlinearities; medium noise mechanisms and correlations; signal to noise ratios. *Prerequisites: undergraduate electromagnetic theory and mathematical methods or consent of instructor.* (alternate years)

246C. Magnetic Recording Laboratory (4)
Basic measurements in magnetic recording. Fields and Fourier transforms of head structures using resistance paper measurements and computer analysis; inductance and B-H loop measurements of recording heads and core materials; recording system calibration and magnetization pattern investigation utilizing spectral measurements (FFT). *Prerequisites: ECE 246B and laboratory experience.* (alternate years)

247A. Advanced BioPhotonics (4)
Basic physics and chemistry for the interaction of photons with matter, including both biological and synthetic materials; use of photonic radiation pressure for manipulation of objects and materials; advanced optoelectronic detection systems, devices and methods, including time resolved fluorescent and chemiluminescent methods, fluorescent energy transfer (FRET) techniques, quantum dots, and near-field optical techniques; underlying mechanisms of the light sensitive biological systems, including chloroplasts for photosynthetic energy conversion and the basis of vision processes. Cross-listed with BENG 247A. *Prerequisite: graduate standing.* (F)

247B. BioElectronics (4)
Topics to be covered will include photolithographic techniques for high-density DNA microarray production, incorporation of CMOS control into electronic DNA microarrays, direct electronic detection technology used in microarrays and biosensor devices, and focus on problems related to making highly integrated devices (lab-on-a-chip, in-vivo biosensors, etc.) from heterogeneous materials and components. Cross-listed with BENG 247B. *Prerequisite: graduate standing.* (W)

247C. BioNanotechnology (4)
Topics include: nanosensors and nanodevices for both clinical diagnostics and biowarfare (bioterror) agent detection; nanostructures for drug delivery; nanoarrays and nanodevices; use of nanoanalytical devices and systems; methods and techniques for modification or functionalization of nanoparticles and nanostructures with biological molecules; nanostructural aspects of fuel cells and bio-fuel cells; potential use of DNA and other biomolecules for computing and ultra-high-density data storage. Cross-listed with BENG 247C. *Prerequisite: graduate standing.* (S)

250. Random Processes (4)
Random variables, probability distributions and densities, characteristic functions. Convergence in probability and in quadratic mean, Stochastic processes, stationarity. Processes with orthogonal and independent increments. Power spectrum and power spectral density. Stochastic integrals and derivatives. Spectral representation of wide sense stationary processes, harmonizable processes, moving average representations. *Prerequisite: ECE 153 or equivalent or consent of instructor.* (F)

251AN. Digital Signal Processing I (4)
Discrete random signals; conventional (FFT based) spectral estimation. Coherence and transfer function estimation; model-based spectral estimation; linear prediction and AR modeling. Levinson-Durbin algorithm and lattice filters, minimum variance spectrum estimation. *Prerequisites: ECE 153 in addition to either ECE 161 or 161A, or consent of instructor.* (W)

251BN. Digital Signal Processing II (4)
Adaptive filter theory, estimation errors for recursive least squares and gradient algorithms, convergence and tracking analysis of LMS, RLS, and Kalman filtering algorithms, comparative performance of Weiner and adaptive filters, transversal and lattice filter implementations, performance analysis for equalization, noise cancelling, and linear prediction applications. *Prerequisite: ECE 251AN.* (S)

251CN. Filter Banks and Wavelets (4)
Fundamentals of multirate systems (noble identities, polyphase representations), maximally decimated filter banks (QMF filters for 2-channels, M-channel perfect reconstruction systems), paraunitary perfect reconstruction filter banks, the wavelet transform (multiresolution, discrete wavelet transform, filter banks and wavelet). *Prerequisite: ECE 161B or equivalent.* (F)

251DN. Array Processing (4)
The coherent processing of data collected from sensors distributed in space for signal enhancement and noise rejection purposes or wavefield directionality estimation. Conventional and adaptive beamforming. Matched field processing. Sparse array design and processing techniques. Applications to acoustics, geophysics, and electromagnetics. *Prerequisite: 251AN, ECE 161 or 151A (ECE 161, 162A-B series recently renumbered to ECE 161A-B-C), or consent of instructor.* (F)

252A. Speech Compression (4)
Speech signals, production and perception, compression theory, high rate compression using waveform coding (PCM, DPCM, ADPCM,. .), DSP tools for low rate coding, LPC vocoders, sinusoidal tranform coding, multi-band coding, medium rate coding using code excited linear prediction (CELP). *Prerequisite: ECE 161A or 161.* (W)

252B. Speech Recognition (4)
Signal analysis methods for recognition, dynamic time warping, isolated word recognition, hidden markov models, connectedword, and continuous speech recognition. *Prerequisites: ECE 109, ECE 262A.* (S)

253A. Fundamentals of Digital Image Processing (4)
Image quantization and sampling, image transforms, image enhancement, image compression. *Prerequisites: ECE 109, 153, ECE 161 or ECE 161A.* (W)

253B. Digital Image Analysis (4)
Image morphology, edge detection, scene segmentation, texture analysis, registration and fusion, feature analysis, time-varying images. *Prerequisite: ECE 253A or consent of instructor.* (S)

254. Detection Theory (4)
Hypothesis testing, detection of signals in white and colored Gaussian noise; Karhunen-Loève expansion, estimation of signal parameters, maximum-likelihood detection; resolution of signals; detection and estimation of stochastic signals; applications to radar, communications, and optics. *Prerequisite: ECE 153.* (F)

255AN. Information Theory (4)
Introduction to basic concepts, source coding theorems, capacity, noisy-channel coding theorem. *Prerequisite: ECE 154A-B-C or consent of instructor.* (F)

255BN/CN. Source Coding I, II (4/4)
Theory and practice of lossy source coding, vector quantization, predictive and differential encoding, universal coding, source-channel coding, asymptotic theory, speech and image applications. *Prerequisite: ECE 250 and 259A or 259AN, or consent of instructor.* (W,S)

256A-B. Time Series Analysis and Applications (4-4)
Stationary processes; spectral representation; linear transformation. Recursive and nonrecursive prediction and filtering; Wiener-Hopf and Kalman-Bucy filters. Series expansions and applications. Time series analysis; probability density, covariance and spectral estimation. Inference from sampled-data, sampling theorems; equally and non-equally spaced data, applications to detection and estimation problem. *Prerequisite: ECE 153.* (F,W)

257A. Multiuser Communication Systems (4)
M/G/1, G1/M/1 queues, imbedded chains. Ergodic theory of Markov chains, classification, ergodic theorems. Multiple access systems, random access protocols, capacity, stability, delay and control, reservation and hybrid schemes. *Prerequisites: ECE 153 and 159A, or equivalent. Note: ECE 159A is an integral part of this course and should be taken in the fall quarter.* (W)

257B. Principles of Wireless Networks (4)
This course will focus on the principles, architectures, and analytical methodologies for design of multi-user wireless networks. Topics to be covered include cellular approaches, call processing, digital modulation, adaptive arrays, broadband networks, and wireless packet access for multimedia service. *Prerequisites: ECE 159B and 154B.* (S)

258A-B. Digital Communication (4-4)
Digital communication theory including performance of various modulation techniques, effects of inter-symbol interference, adaptive equalization, spread spectrum communication. *Prerequisites: ECE 154A-B-C and ECE 254 or consent of instructor.* (W,S)

259AN. Algebraic Coding (4)
Fundamentals of block codes, introduction to groups, rings and finite fields, nonbinary codes, cyclic codes such as BCH and RS codes, decoding algorithms, applications. *Prerequisite: consent of instructor.* (F)

259BN. Trellis-Coded Modulation (4)
Coding theory developed from the viewpoint of digital communications engineering, information theoretic limits for basic channel models, convolutional codes, maximum-likelihood decoding, Ungerboeck codes, codes based on lattices and cosets, rotational invariance, performance evaluation, applications of modem design. *Prerequisites: ECE 154A-B-C, ECE 259A or 259AN, or consent of instructor.* (W)

259CN. Advanced Coding and Modulation for Digital Communications (4)
Advanced coding and modulation techniques for bandwidth-efficient data transmission and recording; constellation shaping by regions, Voronoi constellations, shell mapping, coding for intersymbol-interference channels, precoding methods, multilevel coding; coding for fading channels, applications to wireline and wireless communications, digital recording. *Prerequisites: ECE 259A-B or 259AN-BN.* (S)

260A. VLSI Digital System Algorithms and Architectures (4)
Custom and semicustom VLSI design from the system designer's perspective. VLSI system algorithms, parallel processing architectures and interconnection networks, and design mapping methodologies will be emphasized. VLSI computer-aided design (CAD) tools will be introduced. Knowledge of basic semiconductor electronics and digital design is assumed. *Prerequisites: undergraduate-level semiconductor electronics and digital system design; ECE 165 or equivalent or consent of instructor.* (F)

260B. VLSI Integrated Circuits and Systems Design (4)
Computer arithmetic, control and memory structures for VLSI implementations at logic, circuit, and layout level. Computer-aided design and performance simulations, actual design projects for teams of two to three students per team. Layout done on CAD workstations for project IC chip fabrication. Design projects will be reviewed in class presentation. *Prerequisite: ECE 260A.* (W)

260C. VLSI Advanced Topics (4)
Advanced topics seminar with issues from system theory, to new technologies, to alternative design methodologies will be subject for review. Class discussion, participation and presentations of projects and special topics assignments will be emphasized. The testing results of fabricated IC chips from other VLSI design classes will be presented in class and in a final report. *Prerequisite: ECE 260B.* (S)

261A. Design of Analog and Digital GaAs Integrated Circuits I (4)
Introduction to analytical and computer-aided design (CAD) techniques for microwave integrated circuits. Design of active two-ports using scattering parameters. Monolithic realization of low-noise amplifiers using GaAs FETs and HEMTs. Design of monolithic distributed amplifiers. Design of monolithic power amplifiers and mixers. *Prerequisite: consent of instructor.* (W)

261B. Design of Analog and Digital GaAs Integrated Circuits (4)
Introduction to GaAs digital integrated circuits (IC). Design of simple digital GaAs ICs using DCFL. Design of digital building blocks for complex multipliers, FET butterfly chips, DDS, and oversampled A/D converters. *Prerequisite: consent of instructor.* (S)

264A. CMOS Analog Integrated Circuits and Systems I (4)
Frequency response of the basic CMOS gain stage and current mirror configurations. Advanced feedback and stability analysis; compensation techniques. High-Performance CMOS amplifier topologies. Switched capacitor circuits. Analysis of noise and distortion. *Prerequisites: ECE 164 and 153 or equivalent courses.* (W)

264B. CMOS Analog Integrated Circuits and Systems II (4)
Continuous-time filters: synthesis techniques and CMOS circuit topologies. Switched-capacitor filters: synthesis techniques and CMOS circuit topologies. Overview of CMOS samplers, data converters, mixers, modulators, oscillators, and PLLs. *Prerequisites: ECE 264A and 251A or 251AN.* (S)

264C. CMOS Analog Integrated Circuits and Systems III (4)
Integrated CMOS analog/digital systems: Analog to digital and digital to analog converters, Nyquist versus oversampling, linearity, jitter, randomization, calibration, speed versus resolution, pipeline, folding, interpolation, averaging. *Prerequisites: ECE 163 and 164.* (W)

264D. CMOS Analog Integrated Circuits and Systems IV (4)
PLL: Phase noise effect, VCO, phase detector, charge pump, integer/fractional-N frequency synthesizer, clock and data recovery, decision feedback. Filter: Continuous-time filter, I-Q complex filter, raised-cosine, Gaussian, delay, zero equalizers. *Prerequisites: ECE 163 and 164.* (S)

265A. Communication Circuit Design I (4)
Introduction to noise and linearity concepts. System budgeting for optimum dynamic range. Frequency plan tradeoffs. Linearity analysis techniques. Down-conversion and up-conversion techniques. Modulation and de-modulation. Microwave and RF system design communications. Current research topics in the field. *Prerequisites: consent of instructor.* (F)

265B. Communication Circuit Design II (4)
Radio frequency integrated circuits: impedance matching concepts, low-noise amplifiers, AGCs. Mixers, filters. Comparison between BJT, CMOS and GaAs technologies for radio frequency and microwave applications. Device modeling for radio frequency applications. Design tradeoffs of linearity, noise, power dissipation, and dynamic range. Current research topics in the field. *Prerequisites: ECE 164 and 265A or consent of instructor.* (W)

270A-B-C. Neurocomputing (4-4-4)
Neurocomputing is the study of biological information processing from an artificial intelligence engineering perspective. This three-quarter sequence covers neural network structures for arbitrary object (perceptual, motor, thought process, abstraction, etc.) representation, learning of pairwise object attribute descriptor antecedent support relationships, the general mechanism of thought, and situationally responsive generation of movements and thoughts. Experimental homework assignments strongly reinforce the fundamental concepts and provide experience with myriad associated technical issues. *Prerequisite: graduate standing, an understanding of mathematics through basic linear algebra and probability, or consent of instructor.* (F,W,S)

272A. Stochastic Processes in Dynamic Systems (4)
(Not offered 2001/2002.) Diffusion equations, linear and nonlinear estimation and detection, random fields, optimization of stochastic dynamic systems, applications of stochastic optimization to problems. *Prerequisites: ECE 250.* (W,S)

275A. Parameter Estimation I (4)
Linear last squares (batch, recursive, total, sparse, psuedoinverse, QR, SVD); statistical figures of merit (bias, consistency, Cramer-Rao lower-bound, efficiency); maximum likelihood estimation (MLE); sufficient statistics; algorithms for computing the MLE including the expectation maximation (EM) algorithm. The problem of missing information; the problem of outliers. *Prerequisites: ECE 109 and ECE 153 with grades of C- or better.* (F)

275B. Parameter Estimation II (4)
The Bayesian framework and the use of statistical priors; sufficient statistics and reproducing probability distributions; minimum mean square estimation (MSE); linear minimum mean square estimation; maximum a posteriori (MAP) estimation; minimax estimation; Kalman filter and extended Kalman filter (EKF) Baum-Welsh algorithm; Viterbi algorithm. Applications to identifying the parameters and states of hidden Markov models (HMMs) including ARMA, state-space, and finite-state dynamical systems.

Applications to parametric and non-parametric density estimation. *Prerequisites: ECE 153 and ECE 275A with grades of C– or better.* (W)

276A-B. Robot Kinematics, Dynamics, and Control (4-4)
Kinematics of rigid bodies and serial-chain manipulators. The forward and inverse kinematics problem. Sufficient conditions for exact solvability of the inverse kinematics problem. Joint-space versus tank-space control. Path/trajectory generation. Newton-Euler and Lagrangian formulation of manipulatory dynamics. Manipulability measures. Redundancy resolution by subtask functional optimization and side-constraint satisfaction. Pseudo-inverse kinematic control of redundant manipulators. PID and feedback-linearizing trajectory and force control. Issues in path planning and compliant assembly. *Prerequisites: ECE 171A-B, ECE 174 must be completed with grades of C– or better. (ECE 174 may be concurrent.)* (W-S)

280. Special Topics in Electronic Devices and Materials (4)
A course to be given at the discretion of the faculty at which topics of interest in electronic devices and materials will be presented by visiting or resident faculty members. It will not be repeated so it may be taken for credit more than once. *Prerequisite: consent of instructor.*

282. Special Topics in Optoelectronics (4)
A course to be given at the discretion of the faculty at which topics of interest in optoelectronic materials, devices, systems, and applications will be presented by visiting or resident faculty members. It will not be repeated so it may be taken for credit several times. *Prerequisite: consent of instructor.*

283. Special Topics in Electronic Circuits and Systems (4)
A course to be given at the discretion of the faculty at which topics of interest in electronic circuits and systems will be presented by visiting or resident faculty members. It will not be repeated so it may be taken for credit more than once. *Prerequisite: consent of instructor.*

284. Special Topics in Computer Engineering (4)
A course to be given at the discretion of the faculty at which topics of interest in computer engineering will be presented by visiting or resident faculty members. It will not be repeated so it may be taken for credit more than once. *Prerequisite: consent of instructor.*

285. Special Topics in Robotics and Control Systems (4)
A course to be given at the discretion of the faculty at which topics of interest in robotics and control systems will be presented by visiting or resident faculty members. It will not be repeated so it may be taken for credit more than once. *Prerequisite: consent of instructor.*

287A,B. Special Topics in Communication Theory and Systems (4)
A course to be given at the discretion of the faculty at which topics of interest in information science will be presented by visiting or resident faculty members. It will not be repeated so it may be taken for credit more than once. *Prerequisite: consent of instructor.*

288. Special Topics in Applied Physics (1-8)
Topics of interest in applied physics. Topics will vary from quarter to quarter. May be repeated for credit not more than three times.

290. Graduate Seminar on Current ECE Research (2)
Weekly discussion of current research conducted in the Department of Electrical and Computer Engineering by the faculty members involved in the research projects.

291. Industry Sponsored Engineering Design Project (4)
One or two students as a group design, build, and demonstrate an engineering project that is sponsored by local industry. All students give a weekly progress report on their tasks and write a final report. The projects originate from the actual needs of industry in the general area of electrical and computer engineering. This course may count towards the fulfillment of the MEng degree. Individual final exam and final presentation. *Prerequisite: ECE 230 or 240 or 251 or 253 or 258 or equivalent.*

293. Graduate Seminar in Communication Theory and Systems (2)
Weekly discussion of current research literature.

294. Graduate Seminar in Applied Solid State Physics (2)
Research topics in applied solid state physics and quantum electronics.

296. Graduate Seminar in Optical Signal Processing (2)
Research topics of current interest in holography.

298. Independent Study (1-16)
Open to properly qualified graduate students who wish to pursue a problem through advanced study under the direction of a member of the staff. (S/U grades only.) *Prerequisite: consent of instructor.*

299. Research (1-16)
(S/U grade only.)

501. Teaching (1-4)
Teaching and tutorial activities associated with courses and seminars. Not required for candidates for the Ph.D. degree. Number of units for credit depends on number of hours devoted to class or section assistance. (S/U grade only.) *Prerequisite: consent of department chair.*

Mechanical and Aerospace Engineering (MAE)

STUDENT AFFAIRS: 182 Engineering Building II, Warren College
http://maeweb.ucsd.edu
http://aerospace.ucsd.edu

Professors

D. J. Benson, Ph.D.
R. Bitmead, Ph.D.
R. J. Cattolica, Ph.D.
P. C. Chau, Ph.D.
R. W. Conn, Ph.D.
C. H. Gibson, Ph.D.
J. D. Goddard, Ph.D.
A. Hoger, Ph.D.
S. Jin. Ph.D., *Director, Materials Science Program*
S. Krasheninnikov, Ph.D.
M. Krstic, Ph.D.
J. Lasheras, Ph.D.
P. F. Linden, Ph.D., *Blasker Chair in Environmental Engineering*
X. Markenscoff, Ph.D.
J. M. McKittrick, Ph.D.
M. A. Meyers, Ph.D.
D. R. Miller, Ph.D., *Acting Senior Vice Chancellor for Academic Affairs*
H. Murakami, Ph.D.
S. Nemat-Nasser, Ph.D., *Director, Center of Excellence for Advanced Materials*
V. Nesterenko, Ph.D.
C. Pozrikidis, Ph.D.
S. Sarkar, Ph.D.
K. Seshadri, Ph.D.
R. E. Skelton, Ph.D.
J. B. Talbot, Ph.D.
F. E. Talke, Ph.D., *CMRR Endowed Chair*
K. S. Vecchio, Ph.D.
F. A. Williams, Ph.D., *Director, Center for Energy Research*

Professors Emeritus

H. Bradner, Ph.D.
P. A. Libby, Ph.D.
S.-C. Lin, Ph.D.
S. Middleman, Ph.D.
J. W. Miles, Ph.D.
W. Nachbar, Ph.D.
D. B. Olfe, Ph.D.
S. S. Penner, Ph.D.
A. M. Schneider, Sc.D.
H. W. Sorenson

Associate Professors

C. P. Caulfield, Ph.D.
R. K. Herz, Ph.D.
W. M. McEneany, Ph.D.
K. Nomura, PhD.
G. Tynan, Ph.D.

Assistant Professors

P. Bandaru, Ph.D.
F. Beg, Ph.D.
T. R. Bewley, Ph.D.
S. Buckley, Ph.D.
R. DeCallafon, Ph.D.
S. Gille, Ph.D.
S. G. Llewellyn-Smith, Ph.D.

Affiliated Faculty

L. Armi, Ph.D., *Professor, SIO*
Y. Bahadori, Ph.D., *Associate Adjunct Professor, MAE*
M. J. Bailey, Ph.D., *Adjunct Professor, MAE*
C. Baker, *Adjunct Professor, MAE; Deputy Director, CER*
M. Buckingham, Ph.D., *Professor, SIO*
N. Delson, Ph.D., *Academic Coordinator*
M. Kassner, Ph.D., *Adjunct Professor, MAE*
V. Lubarda, Ph.D., *Adjunct Professor, MAE*
W. K. Melville, Ph.D., *Professor, SIO*
F. Najmabadi, *Professor, Electrical and Computer Engineering*
N. Peters, Ph.D., *Adjunct Professor, MAE*
R. Pinkel, Ph.D., *Professor, SIO*
J. Rottman, Ph.D., *Adjunct Professor, MAE*
F. Speiss, Ph.D., *Professor Emeritus, SIO*

Professional Research Staff

G. Antar, Ph.D., *Assistant Project Scientist, CER/MAE*
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M. Tillack, Ph.D., *Research Scientist, MAE/CER*

The Department of Mechanical and Aerospace Engineering is a re-organization of the former Applied Mechanics and Engineering Sciences (AMES) Department. The MAE Department administers the interdepartmental Chemical Engineering Program (CENG). The Structural Engineering Department (SE) is a separate department.

Entering MAE freshmen will follow the new set of course work guidelines detailed in this section. Continuing students and transfer students will continue with their current set of course work guidelines outlined in previous general catalogs. The Student Affairs Office can provide the proper curriculum tables.

All MAE, CENG and AMES students are encouraged to visit the Student Affairs Office in EBU II for any clarification. SE students will refer to the SE section of the general catalog and should visit the Student Affairs Office located on the third floor of the Science and Engineering Research Facility (SERF).

Department Focus

The instructional and research programs are grouped into two major areas: mechanical engineering and aerospace engineering. Both the undergraduate and graduate programs are characterized by strong interdisciplinary relationships with the Departments of Physics, Mathematics, Bioengineering, Chemistry, Electrical and Computer Engineering, Computer Science and Engineering, Structural Engineering, the Materials Science Program, and associated campus institutes such as the UCSD Center for Energy Research, the Institute for Nonlinear Science, Institute of Geophysics and Planetary Physics, Institute for Pure and Applied Physical Sciences, Institute for Biomedical Engineering, Center for Magnetic Recording Research, Center of Excellence for Advanced Materials, California Space Institute, and Scripps Institution of Oceanography.

The educational mission of the department is to provide an excellent education to the next generation of mechanical and aerospace engineers as one of the nation's leading and most innovative mechanical and aerospace engineering departments.

This broad mission is supported by the following specific educational goals:

- To provide our students with a strong technical education that will enable them to have successful careers as professional mechanical aerospace and chemical engineers, as educators in academia, and as members of other professions.
- To prepare our students for rapid technological change with the core knowledge central to assuring that they are able to continuously improve their skills across a range of disciplines throughout their professional careers.
- To prepare our students to communicate effectively and to deal knowledgeably and ethically with the impact of technology in our society and on global issues.

The Undergraduate Program

Degree and Program Options

The Department of Mechanical and Aerospace Engineering (MAE) offers traditional ABET accredited engineering programs leading to the B.S. degree in mechanical engineering, and aerospace engineering. MAE also offers traditional nonaccredited engineering programs leading to the B.S. degree in engineering science and environmental engineering. The B.S. programs require a minimum of 196 units. The Chemical Engineering Program (CENG) is an interdepartmental program and is described more completely under the Chemical Engineering Program section in this catalog.

All MAE programs of study have strong components in laboratory experimentation, numerical computation, and engineering design. Design is emphasized throughout the curricula by open-ended homework problems, by laboratory and computer courses which include student-initiated projects, and finally by senior design project courses which often involve teams of students working to solve engineering design problems brought in from industry. The MAE programs are designed to prepare students receiving bachelor's degrees for professional careers or for graduate education in their area of specialization. In addition, the programs can also be taken by students who intend to use their undergraduate engineering education as preparation for postgraduate professional training in nontechnical fields such as business administration, law, or medicine.

Mechanical engineering is a traditional four-year curriculum in mechanics, vibrations, thermodynamics, fluid flow, heat transfer, materials, control theory, and mechanical design. Graduates find employment in the mechanical and aerospace industries as well as electro-mechanical or biomedical industries. Mechanical engineers are involved in material processing, manufacturing, assembling, and maintenance of life-line facilities such as power plants.

Mechanical design includes conceptual design, drafting with 3D CAD programs, stress, dynamics, heat transfer or fluid dynamics analyses, and the optimization of the total system for superior performance and customer satisfaction. In manufacturing, the objective is to enhance efficiency and economy by utilizing numerical control (NC) of machine tools, mechatronics, micro-machining, and rapid prototyping. Currently, engineers have available computers, process models, and sensors to improve the quality and productivity of the manufacturing lines. In preparation for this modern era, the mechanical engineering curriculum emphasizes CAD courses, computer courses, laboratory courses, and design courses in addition to providing a strong background in basic science.

The following educational objectives have been established for the mechanical engineering program:

1. To provide a sound introduction to the basic sciences that underlie the disciplines of mechanical and aerospace engineering
2. To provide a thorough training in methods of analysis, including problem formulation and the mathematical and computational skills required by mechanical engineers
3. To teach students the experimental and data analysis techniques required for engineering applications
4. To teach the fundamentals of the design process, including project management, the synthesis of information from different disciplinary areas, and innovation and creative problem solving in an engineering setting
5. To prepare students in the skills required for successful participation on teams and in leadership positions, including effective written and oral communication
6. To instill in our students an understanding of their professional and ethical responsibilities
7. To provide students with the opportunity to gain a range of experiences through classroom and extramural activities on campus and through partnerships and internships with industry, with primary and secondary schools, and with other organizations

Aerospace engineering is a four-year curriculum that prepares students for a career in the aeronautical and astronautical industries, related technology industries, or for graduate school.

The mission of the aerospace engineering program is to prepare students to be outstanding scientists and engineering leaders by emphasizing engineering fundamentals, principles of professional practices, and their integration into the design/development of advanced aeronautical and astronautical systems. The primary goals are:

- to provide our students with a strong technical education that will enable them to have successful careers as professional aerospace engineers, as educators in academia, and as members of other professions
- to prepare our students for rapid technological change with the core knowledge central to assuring that they are able to continuously improve their skills across a range of disciplines throughout their professional careers
- to prepare our students to communicate effectively and to deal knowledgeably and ethically with the impact of technology in our society and on global issues

The curriculum was developed to emphasize engineering fundamentals, aerospace topics, and the integration of these fundamentals and topics into the design of an aerospace system. Courses in engineering fundamentals include materials, solid and fluid mechanics, thermodynamics, computer modeling, computer-aided-design, numerical analysis, and controls. Courses covering the aerospace engineering topics include aerodynamics, aerospace structures, flight mechanics, dynamics and control of aerospace vehicles, and propulsion. Students complete the program by taking a two-quarter capstone design course that integrates all of their aerospace education into the design, development, and testing of an aeronautical or astronautical vehicle or component. Throughout the program, students take laboratory courses that expose them to modern testing techniques and enhance their understanding of complex engineering topics. The program's main objectives are:

1. to provide students with a strong foundation in engineering fundamentals; in-depth knowledge of key topics in aerospace engineering including aerodynamics, propulsion, flight mechanics, orbital mechanics, aerospace structures and materials, and design and control of aerospace systems; and an awareness of the value of life-long learning
2. to provide thorough training in methods of analysis and problem-solving including mathematical and computational skills and use of contemporary software and information technology tools
3. to teach students the experimental and data analysis techniques required for aerospace engineering applications
4. to teach the fundamentals of the openended design process, including project management, synthesis and integration of information from fundamental and interdisciplinary areas, manufacturing and incorporation of non-technical issues, and innovation and creative problem solving in an engineering environment
5. to prepare students with the skills required for successful participation on teams and for leadership positions, including effective written and oral communication skills and professionalism
6. to instill in our students an understanding of the role and importance of professional responsibility and engineering ethics
7. to provide students with the opportunity to gain a range of experiences through classroom and extramural activities on campus and through participation and internships with industry and other organizations

Further discussion of the degree requirements and policies are provided in the Aerospace Engineering Undergraduate Student Handbook.

The **engineering science** program resembles the Mechanical Engineering Program, except the amount of mechanical design is reduced and control theory is not required. In addition to core courses in dynamics, vibrations, structures, fluid mechanics, thermodynamics, heat transfer, and laboratory experimentation, a large number of technical electives are scheduled. This aspect of the curriculum allows flexibility by permitting specialization and in-depth study in one area of the engineering sciences or through a sequence of courses on various emerging technologies. Students must consult their advisers to develop a sound course of study to fulfill the technical elective of this program. Although a sequence in non-sciences may be permitted, the faculty advisers may insist on a substantial number of MAE or other science courses as technical electives.

Environmental engineering is a four-year curriculum that resembles the chemical engi-

neering curriculum in its first two years, with fundamental engineering courses in mechanics, thermodynamics, physics, chemistry, and mathematics. In the third and fourth year, the programs diverge: an environmental engineering sequence is offered, as well as further specialization in fluid mechanics, and a wide choice of technical electives, both from within MAE and other departments. The environmental engineering major focuses on conveying an understanding and awareness of the fundamental processes associated with human industrial activity that have environmental implications, and on equipping the next generation of engineers with the tools to develop technologies that enable sustainable economic growth.

The following educational objectives have been established for the environmental engineering program:

1. to provide a sound introduction to the basic sciences that underlie the disciplines of environmental engineering
2. to provide a thorough training in methods of analysis, including problem formulation and the mathematical and computational skills required by environmental engineers
3. to teach students the experimental and data analysis techniques required for engineering applications
4. to teach the fundamentals of the design process, including project management, the synthesis of information from different disciplinary areas, and innovation and creative problem solving in an engineering setting
5. to prepare students in the skills required for successful participation on teams and in leadership positions, including effective written and oral communication
6. to instill in our students an understanding of their professional and ethical responsibilities
7. to provide students with the opportunity to gain a range of experiences through classroom and extramural activities on campus and through partnerships and internships with industry, with primary and secondary schools, and with other organizations

Other Undergraduate Programs of Study in MAE

The **engineering mechanics minor** involves successful completion of seven MAE courses, including at least five upper-division courses open to students who meet the course prerequisites: one must be MAE 130A; one must be 101A (or CENG 101A) or 131A (or both may be taken); and the balance must be selected from MAE 3, 9 or 10, 20, 110A, CENG 102, 130B, and 160. This set of courses provides a good introduction to engineering analysis and would be useful to nonengineering majors desiring a background that could be used in professional communication with engineers.

Other minor options are restricted. Students wishing to arrange a sequence of MAE courses to satisfy minor requirements, or to meet particular academic interests, must consult the MAE Student Affairs Office for referral to the appropriate MAE faculty member.

Program Accreditation

The B.S. programs in mechanical engineering are accredited by the Engineering Accreditation Commission of the Accreditation Board for Engineering and Technology (ABET/EAC).

Major Requirements

Specific course requirements for each major program are outlined in tables in this section of the catalog. In addition to the required technical courses specifically indicated, a suggested scheduling of humanities and social science courses (HSS) are distributed in the curricula for students to use to meet college general-education requirements. To graduate, students must maintain an overall GPA of at least 2.0, and the department requires at least a C– grade in each course required for the major.

Deviations from these programs of study must be approved by the Undergraduate Affairs Committee prior to taking alternative courses. In addition, technical elective (TE) course selections must have departmental approval *prior* to taking the courses. In the accredited programs, TE courses are restricted to meet ABET standards. Courses such as MAE 195, 197, and 198 are not allowed as a technical elective in meeting the upper-division major requirements. MAE 199 can be used as a technical elective only under restrictive conditions. Policy regarding these conditions may be obtained from the department's Student Affairs Office.

Students with different academic preparation may vary the scheduling of lower-division courses such as math, physics and chemistry, but should consult the department. Deviations in scheduling MAE upper-division courses is discouraged and requires prior approval. Most lower-division courses are offered more than once each year to permit students some flexibility in their program scheduling. However, many MAE upper-division courses are taught only once per year, and courses are scheduled to be consistent with the curricula as shown in the tables. When possible, MAE does offer large enrollment courses more than once each year. A tentative schedule of course offerings is available from the department each spring for the following academic year.

General-Education/ College Requirements

For graduation each student must satisfy general-education course requirements determined by the student's college as well as the major requirements determined by the department. The six colleges at UCSD require widely different general-education courses, and the number of such courses differs from one college to another. Each student should choose his or her college carefully, considering the special nature of the college and the breadth of general education.

Each MAE program allows for humanities and social science (HSS) courses so that students can fulfill their college requirements. In the ABET accredited programs, students must develop a program that includes a total of at least twenty-four units in the arts, humanities, and social sciences, not including subjects such as accounting, industrial management, finance, or personnel administration. It should be noted, however, that some colleges require more than the nine or ten HSS courses indicated in the curriculum tables. Accordingly, students in these colleges could take longer to graduate than the indicated four-year schedule. Students must consult with their college to determine which HSS courses to take.

Professional Licensing

After graduation, all students are encouraged to take the Fundamentals of Engineering (FE) examination as the first step in becoming licensed as a professional engineer (PE). Students graduating from an accredited program can take the PE examination after FE certification and two years of work experience; students graduating from a nonaccredited program can take the PE

examination after FE certification and four years of work experience.

For further information please contact your local Board of Registration for Professional Engineers and Land Surveyors.

Four-Year Programs in Engineering

Two computer languages, C/C++ (MAE 9) and FORTRAN (MAE 10) are offered to MAE students but only one course is required. FORTRAN (MAE 10) is recommended for students interested in software development of large-scale computer codes for calculation of the response of structures and machines, and for the simulation of new products and manufacturing processes. C/C++ (MAE 9) is recommended for students who plan to be involved in data acquisition, parallel processing over the network, and use of CAD software for design and graphics.

Mechanical Engineering

The Mechanical Engineering Program has a traditional ABET accredited four-year curriculum involving mechanics, vibrations, thermodynamics, fluid flow, heat transfer, materials, control theory, and mechanical design. Graduates of this program are expected to have the following skills, knowledge, and abilities:

1. An ability to apply knowledge of mathematics, science, and engineering to mechanical engineering problems
2. An ability to design and conduct experiments, as well as to analyze and interpret data
3. An ability to design mechanical and thermal systems, components, or processes to meet desired needs
4. An ability to function on multi-disciplinary teams
5. An ability to identify, formulate, and solve engineering problems
6. An understanding of professional and ethical responsibility
7. An ability to communicate effectively with written, oral, and visual means
8. The broad education necessary to understand the impact of engineering solutions in a global and societal context
9. A recognition of the need for, and an ability to engage in life-long learning
10. A knowledge of contemporary issues
11. An ability to use modern engineering techniques, skills, and computing tools necessary for engineering practice.
12. A familiarity with chemistry, calculus-based physics, and advanced mathematics
13. Familiarity with probability theory, statistics, and linear algebra

Recommended Course Sequence—Mechanical Engineering for Students entering fall 2004

FALL	WINTER	SPRING
FRESHMAN YEAR		
Math. 20A	Math. 20B	Math. 20C
MAE 1	Phys. 2A	Phys. 2B & 2BL
Chem. 6A	Chem. 6B	MAE 3
HSS	HSS	HSS
SOPHOMORE YEAR		
Math. 20D	Math. 20F	Math. 20E
Phys. 2C & 2CL	MAE 9 or 10	MAE 130B
MAE 20	MAE 130A	or SE 101B
HSS	or SE 101A	MAE 131A
	HSS	HSS
JUNIOR YEAR		
MAE 110A	MAE 101A	MAE 101B
MAE 105	MAE 143A	MAE 143B
MAE 140	MAE 130C	MAE 170
MAE 107	MAE 160	HSS
SENIOR YEAR		
MAE 101C	MAE 171A	MAE 171B
MAE 156A	MAE 156B	TE
MAE 150	TE	HSS
TE	HSS	HSS

* Students entering the mechanical engineering major prior to fall 2001 should see the MAE Student Affairs Office for the recommended course sequence.

- Chem. 6AH-6BH sequence may be taken in place of Chem. 6A-B.
- In fulfilling the humanities and social science requirements (HSS), students must take a total of at least twenty-four units in the arts, humanities, and social sciences, not including subjects such as accounting, industrial management, finance, or personnel administration. Ten HSS courses are listed here; individual college requirements may be higher.
- Technical electives (TE) must be an upper-division or graduate course in the engineering sciences, natural sciences or mathematics.
- MAE 141A has been re-numbered to MAE 143B.
- Students entering fall 2001 and later are required to take MAE 143A and should not take ECE 101.

See the MAE Student Affairs Office for a complete list of Technical Electives.

Engineering Science

The engineering science program resembles the mechanical engineering program, except that the course load of mechanical design is reduced, and control theory is not required. In addition to core courses in dynamics, vibrations structures, fluid mechanics, thermodynamics, heat transfer, and laboratory experimentation, a large number of technical electives are scheduled. This aspect of the curriculum allows flexibility, permitting specialization and in-depth study in one area of the engineering sciences or development of a sequence of courses emerging from the current research interests of the faculty of MAE and/or other departments, e.g., sequences in the earth sciences, transportation, or energy-related studies. Students intending to pursue postgraduate professional careers in non-technical fields such as business administration, law, or medicine may develop an appropriate sequence of courses. Although a sequence in the non-sciences may be permitted, the faculty adviser may insist on a substantial number of MAE or other science courses as technical electives. Students must consult their advisers to develop a balanced course of study to fulfill the technical elective requirements of this program. This curriculum also allows the highest number of humanities and social science courses (HSS) to meet college general-education requirements.

Recommended Course Sequence—Engineering Science for Students entering fall 2004*

FALL	WINTER	SPRING
FRESHMAN YEAR		
Math. 20A	Math. 20B	Math. 20C
MAE 1	Phys. 2A	Phys. 2B & 2BL
Chem. 6A	Chem. 6B	MAE 3
HSS	HSS	HSS
SOPHOMORE YEAR		
Math. 20D	Math. 20F	Math. 20E
Phys. 2C & 2CL	MAE 9 or 10	MAE 130B
MAE 20	MAE 130A	or SE 101B
HSS	or SE 101A	MAE 131A
	HSS	HSS
JUNIOR YEAR		
MAE 110A	MAE 101A	MAE 101B
MAE 105	MAE 160	MAE 170
MAE 140	MAE 130C	HSS
MAE 107	HSS	HSS
SENIOR YEAR		
MAE 150	MAE 171A	MAE 171B
MAE 101C	TE	TE
TE	TE	HSS
HSS	HSS	HSS

- Chem. 6AH-6BH sequence may be taken in place of Chem. 6A-B.
- Humanities and social science (HSS) courses should be selected to meet general-education requirements of the colleges. Individual college requirements may be higher or lower than what is listed here.

- Four technical elective (TE) courses must be upper-division or graduate courses in the engineering sciences, natural sciences or mathematics selected with prior approval of the department. A sequence of non-science courses may also be selected with prior approval (see program description).

See the Student Affairs Office for a complete list of Technical Electives.

Aerospace Engineering

Aerospace engineering is an Abet-accredited four-year curriculum that begins with fundamental engineering courses in mechanics, thermodynamics, materials, solid mechanics, fluid mechanics, and heat transfer. Additional courses are required in aerospace structures, aerodynamics, flight mechanics, propulsion, controls, and aerospace design. Graduates of this program enter graduate school or enter the aerospace industry to develop aircraft and spacecraft, but also they find employment in other areas that use similar technologies, such as mechanical and energy-related fields. Examples include automobile, naval, and sporting equipment manufacturing.

Graduates of this program are expected to have the following skills, knowledge, and abilities:

1. an ability to apply knowledge of mathematics, science, and engineering to aerospace engineering problems
2. an ability to design and conduct experments, as well as to analyze and interpret data
3. an ability to design a system, component, or process to meet desired needs
4. an ability to function on multi-disciplinary teams
5. an ability to identify, formulate, and solve engineering problems
6. an understanding of professional and ethical responsibility.
7. an ability to communicate effectively with written, oral, and visual means
8. the broad education necessary to understand the impact of engineering solutions in a global and societal context
9. a recognition of the need for, and an ability to engage in life-long learning
10. a knowledge of contemporary issues
11. an ability to use modern engineering techniques, skills, and computing tools necessary for engineering practice
12. knowledge of key topics in aeronautical engineering including aerodynamics, aerospace materials, structures, propsion, flight mechanics, and stability and control
13. knowledge of topics in astronautical engineering including attitude determination and control, space structures, orbital mechanics, and rocket propulsion
14. an ability to integrate knowledge of the fundamental topics in the design of an aerospace system

Recommended Course Sequence—Aerospace Engineering for Students entering fall 2004

FALL	WINTER	SPRING
FRESHMAN YEAR		
Math. 20A	Math. 20B	Math. 20C
MAE 2	Phys. 2A	Phys. 2B & 2BL
Chem. 6A	HSS	SE 2
HSS	HSS	HSS
SOPHOMORE YEAR		
Math. 20D	Math. 20F	Math. 20E
Phys. 2C& 2CL	MAE 9 or 10	MAE 131A
MAE 3	MAE 130A or	MAE 130B or
HSS	SE 101A	SE 101B
	HSS	HSS
JUNIOR YEAR		
MAE 105	MAE 101A	MAE 101B
MAE 110A	MAE 130C	MAE 143B
MAE 140	MAE 143A	MAE 170
MAE 107	HSS	SE 160A
SENIOR YEAR		
MAE 101C	MAE 155A	MAE 155B
MAE 104	MAE 142	HSS
MAE 150	MAE 175A	HSS
SE 160B	MAE 113	TE

- Chem. 6AH may be taken in place of Chem. 6A.
- In fulfilling the humanities and social science (HSS) requirements, students must take a total of at least twenty-four units in the arts, humanities, and social sciences, not including subjects such as accounting, industrial management, finance, or personnel administration. Ten HSS courses are listed here; individual college requirements may be higher.
- Technical elective (TE) course must be upper-division or graduate courses in engineering sciences, natural sciences, or mathematics selected with a prior approval of the department. See Student Affairs in MAE for a current list of approved TEs.

Recommended Course Sequence—Aerospace Engineering for Students entering fall 1999–2002

FALL	WINTER	SPRING
FRESHMAN YEAR		
Math. 20A	Math. 20B	Math. 21C
MAE 2	Phys. 2A	Phys. 2B & 2BL
Chem. 6A	Chem. 6B	MAE 3
HSS	HSS	HSS
SOPHOMORE YEAR		
Math. 21D	Math. 20F	Math. 20E
Phys. 2C& 2CL	MAE 9 or 10	MAE 130B or
HSS	MAE 130A or	SE 101B
HSS	SE 101A	MAE 131A
	HSS	SE 2
JUNIOR YEAR		
MAE 105	MAE 101A	MAE 101B
MAE 110A	MAE 130C	MAE 143B
MAE 140	MAE 143A	MAE 170
HSS	HSS	SE 160A
SENIOR YEAR		
MAE 101C	MAE 142	HSS
MAE 104	MAE 155A	MAE 155B
MAE 150	MAE 175A	TE
SE 160B	MAE 113	HSS

* Students entering the aerospace major prior to fall 1999 should see the MAE Student Affairs Office for the recommended course sequence.

- Chem. 6AH-6BH sequence may be taken in place of Chem. 6A-B.
- In fulfilling the humanities and social science (HSS) requirements, students must take a total of at least twenty-four units in the arts, humanities, and social sciences, not including subjects such as accounting, industrial management, finance, or personnel administration. Ten HSS courses are listed here; individual college requirements may be higher.
- Technical elective (TE) courses must be upper-division or graduate courses in the engineering sciences, natural sciences or mathematics selected with prior approval of the department. See Student Affairs in MAE for a current list of approved TE's.

Environmental Engineering

The **environmental engineering** program resembles the chemical engineering program for the first two years. In the third and fourth year, the programs diverge: an environmental engineering sequence is offered, as well as further specialization in fluid mechanics, and a wide choice of technical elective (TE) courses, both from within MAE and in other departments.

FALL	WINTER	SPRING
FRESHMAN YEAR		
Math. 20A	Math. 20B	Math. 20C
MAE 9 or 10	Phys. 2A	Phys. 2B & 2BL
Chem. 6A	Chem. 6B/BL	Chem. 6C
HSS	HSS	HSS
SOPHOMORE YEAR		
Math. 20D	Math. 20F	Math. 20E
Phys. 2C & 2CL	CENG 100	CENG 102
Chem. 126 or 131	Chem. 127 or 132	Chem. 140A
HSS	HSS	HSS
JUNIOR YEAR		
MAE 105	MAE 101A	MAE 101B
CENG 120	TE	MAE 170
MAE 107	TE	MAE 124
HSS	HSS	HSS

SENIOR YEAR		
MAE 101C	MAE 126A	MAE 126B
MAE 125A	MAE 125B	TE
TE	TE	TE
HSS	HSS	HSS

- Humanities and social science (HSS) courses should be selected to meet general-education requirements of the colleges. Individual college requirements may be higher or lower than what is listed here.
- Technical electives (6): at least 2 must be from MAE and 2 must be upper-division courses.
- See MAE Student Affairs Office for a complete list of TE's.

Policies and Procedures for MAE Undergraduate Students

Application for Admission to the Major

Admission to the department as an MAE major or minor, or to fulfill a major in another department which requires MAE courses, is in accordance with the general requirements established by the Jacobs School of Engineering. The admission requirements and procedures are described in detail in the section on "Admission to the Jacobs School of Engineering" in this catalog. Applicants who have demonstrated excellent academic performance prior to being admitted to UCSD will be admitted directly to the engineering major of their choice. These directly admitted students and all students are expected to complete lower- and upper-division courses, as suggested in the curriculum tables, in a timely fashion in the sequences outlined.

Transfer Students

Requirements for admission as an MAE major or minor, or into MAE courses, are the same for transfer students as they are for continuing students (see section on "Admission to the Jacobs School of Engineering" in this catalog). Accordingly, when planning their program, transfer students should be mindful of lower-division prerequisite course requirements, as well as for meeting collegiate requirements.

Students who have taken equivalent courses elsewhere may request to have transfer credit apply toward the department's major requirements. To receive transfer credit, complete a MAE Student Petition form and submit it to MAE Student Affairs. For mathematics, chemistry and physics, transfer equivalencies are *determined by the respective departments.* An Undergraduate Student Petition must be submitted to each department from which you are requesting tranfer credit.

Effective **fall 2004**, it is **strongly recommended** that transfer students complete the following preparation for engineering majors*:

- Calculus I—for Science and Engineering (Math. 20A)
- Calculus II—for Science and Engineering (Math. 20B)
- Calculus and Analytic Geometry (Math. 20C)
- Differential Equations (Math. 20D)
- Linear Algebra (Math. 20F)
- Complete calculus-based physics series with lab experience (Physics 2A-B-C)
- Chemistry 6A (except Computer Science and Computer Engineering majors)
- Highest level of introductory computer programming language course offerings at the community college**

*Effective **fall 2006**, these courses will be **required** preparation for all engineering transfer students.

**Refer to the *UCSD General Catalog* to select major prerequisite requirement for computer language courses.

Academic Advising

Upon admission to the major, students should consult the catalog or MAE Web site (http://maeweb.ucsd.edu) for their program of study or their undergraduate adviser if they have questions. The program plan may be revised in subsequent years, but revisions involving curricular requirements require approval by the undergraduate adviser or the Undergraduate Affairs Committee. Because some course and/or curricular changes may be made every year, it is imperative that students consult with the department's undergraduate adviser on an annual basis.

Many MAE courses are offered only once a year and therefore should be taken in the recommended sequence. If courses are taken out of sequence, it may not always be possible to enroll in courses as desired or needed. If this occurs, students should seek immediate departmental advice. When a student deviates from the sequence of courses specified for each curriculum in this catalog, it may be impossible to complete an MAE major within the normal four-year period.

In addition to the advising available through the Student Affairs Office, programmatic or technical advice may be obtained from MAE faculty members. A specific MAE faculty mentor is assigned to each MAE student. All MAE students are required to meet with their faculty mentor at least once a quarter.

Program Alterations/ Exceptions to Requirements

Variations from or exceptions to any program or course requirements are possible only if a petition is approved by the MAE Undergraduate Affairs Committee before the courses in question are taken. Petition forms may be obtained from the MAE Student Affairs Office and must be processed through this office.

Independent Study

MAE students may take MAE 199, Independent Study for Undergraduates, under the guidance of an MAE faculty member. This course is taken as an elective on a P/NP basis. Under very restrictive conditions, however, it may be used to satisfy upper-division technical elective course requirements for the major. Students interested in this alternative must identify an MAE faculty member with whom they wish to work and propose a two-quarter research or study topic. After obtaining the faculty member's concurrence on the topic and scope of the study, the student must submit a Special Studies Course form (each quarter) and an MAE 199 as Technical Elective Contract form to the Undergraduate Affairs Committee. These forms must be completed, approved, and processed prior to the add/drop deadline. Detailed policy in this regard and the requisite forms may be obtained from the Student Affairs Office.

Teaching

Students interested in participating in the instructional activities of the department may take MAE 195, Undergraduate Teaching. Normally, this course is taken as an elective on a P/NP basis. Under very restrictive conditions, it may be used to satisfy upper-division technical elective course requirements for the major. Policy in this regard and the appropriate forms may be obtained from the Student Affairs Office.

Integrated Bachelor's/Master's Degree Program

An integrated program leading to a bachelor of science and a master of science degree in engineering is offered to undergraduate students who are enrolled in any of the major programs offered by the Department of MAE. Contact the MAE Graduate Student Affairs Office for details.

The program is open only to UCSD undergraduates. The Department of MAE does not have financial assistance available for students enrolled in this program.

The Graduate Program

The Department of Mechanical and Aerospace Engineering offers graduate instruction leading to the **M.S. and Ph.D. degrees in engineering sciences** with a designated specialization in each of the following areas: aerospace engineering, applied mechanics, applied ocean sciences, engineering physics, and mechanical engineering.

Admission is in accordance with the general requirements of the graduate division, which requires a B.S. and/or M.S. degree in some branch of engineering, the physical sciences, or mathematics; an overall GPA of 3.0; and three letters of recommendation from individuals who can attest to the academic or professional competence and to the depth of their interest in pursuing graduate study. In addition, all applicants are required to submit GRE General Test scores. A minimum score of 550 on the Test of English as a Foreign Language (TOEFL) is required of all international applicants whose native language is not English and whose undergraduate education was conducted in a language other than English. Students who score below 600 on the TOEFL examination are strongly encouraged to enroll in an English as a second language program before beginning graduate work. (UCSD Extension offers an excellent English language program during the summer as well as the academic year.) Applicants are judged competitively. Based on the candidate's background, qualifications, and goals, admission to the program is in one of three categories: M.S. *only*, M.S., or Ph.D. Admission to the M.S. *only* category is reserved for students for whom the MS degree is likely to be the terminal graduate degree. The M.S. designation is reserved for students currently interested in obtaining an M.S. degree but who at a later time may wish to continue in the doctoral degree program. Admission to the Ph.D. program is reserved for qualified students whose final aim is a doctoral degree. Policies for possible changes in status are given under the "Master's Degree Program" below.

Non-matriculated students are welcome to seek enrollment in MAE courses via UC Extension's concurrent registration program, but an extension student's enrollment in an MAE graduate course must be approved by the instructor.

Master's Degree Program

The M.S. program is intended to extend and broaden an undergraduate background and/or equip practicing engineers with fundamental knowledge in their particular fields. The degree may be terminal, or obtained on the way to the Ph.D. The degree is offered under both the Thesis Plan I and the Comprehensive Examination Plan II (see "Graduate Studies: Master's Degree"). A strong effort is made to schedule M.S.-level course offerings so that students may obtain their M.S. degree in one year of full-time study or two years of part-time study.

M.S. Time Limit Policy: Full-time M.S. students are permitted seven quarters in which to complete all requirements. While there are no written time limits for part-time students, the department has the right to intervene and set individual deadlines if it becomes necessary.

Course requirements are flexible in the applied mechanics and engineering physics programs. Specific departmental requirements for the M.S. degree are as follows:

Thesis Plan I: This plan of study involves both course work and research, culminating in the preparation of a thesis. A total of forty-eight units of credit is required: thirty-six units (nine courses) must be in course work, and twelve units must be in research. The student's program is arranged, with prior approval of the faculty adviser, according to the following policies:

1. Course work must include sixteen units (four courses) of MAE 200-level courses.
2. Units obtained in MAE 205, 259, or 299 may not be applied toward the course work requirement.
3. No more than a total of eight units of MAE 296 and 298 may be applied toward the course work requirement.
4. No more than twelve units of upper-division 100-level courses may be applied toward the course work requirement.
5. Twelve units of MAE 299 must be taken to fulfill the research requirement.

Students must maintain at least a B average in the courses taken to fulfill the degree requirements. A thesis based on the research is written and subsequently reviewed by the thesis adviser and two other faculty members appointed by the dean of Graduate Studies. The review is normally an oral defense of the thesis.

Comprehensive Examination Plan II: This plan of study involves course work only and culminates in a comprehensive examination. A total of forty-eight units of credit (twelve courses) is required. The student's program is arranged, with prior approval of the faculty adviser, according to the following policies:

1. At least sixteen units (four courses) must be MAE 200-level courses.
2. Units obtained in MAE 205, 259, or 299 may not be applied toward the degree requirements.
3. No more than a total of eight units of MAE 296 and 298 may be applied toward the degree requirements.
4. No more than twelve units of upper-division 100-level courses may be applied toward the degree requirements.

Students must maintain at least a B average in the courses taken to fulfill the degree requirements. The comprehensive examination is conducted by the adviser and at least two other faculty members. The examination committee normally conducts an oral examination in two areas of specialization covered by course work taken by the student. A student working toward the Ph.D. degree who has successfully passed two areas of the department's Ph.D. examination need not take the comprehensive examination for the M.S. degree.

Change of Degree. Upon completion of the requirements for the M.S. degree, students admitted as M.S. *only* or M.S. candidates are not automatically eligible for admission to the Ph.D. program.

M.S. *only* candidates who subsequently wish to pursue a doctorate must submit an application for a change in status to their examining committee. If the recommendation is positive and the request approved, the student must

submit a general petition for graduate students to effect the change of status. In addition, the examining committee may recommend that the examination satisfy one of the three topics required in the departmental qualifying examination for the doctorate.

M.S. candidates who subsequently wish to pursue a doctorate must also submit an application for a change in status to their examining committee. In this case, a special examination is not required. The application, however, must be approved and signed by an MAE faculty member who expects to serve as the student's Ph.D. adviser. When the request is approved, the student must submit a general petition for graduate students to effect the change of status. If the student elects the comprehensive examination plan for the M.S. degree, this examination may be used not only to fulfill the requirement for the M.S. degree but also to satisfy one of the three topics required in the departmental qualifying examination for the doctorate. In fact, the M.S. examination may be part of the doctoral examination.

M.S. Program

To complete an M.S. degree with specialization in aerospace engineering, engineering physics, mechanical engineering, applied mechanics, or applied ocean sciences, students must complete a sequence of courses unique to their area. Students should consult with their faculty adviser, as well as the MAE Graduate Student Affairs Office, when choosing their courses.

Doctoral Degree Program

The MAE Ph.D. program is intended to prepare students for a variety of careers in research and teaching. Therefore, depending on the student's background and ability, research is initiated as soon as possible. In general, there are no formal course requirements for the Ph.D. All students, in consultation with their advisers, develop course programs that will prepare them for the MAE Departmental Qualifying Examination and for their dissertation research. However, these programs of study and research must be planned to meet the time limits established to advance to candidacy and to complete the requirements for the degree. Doctoral students who have passed the Departmental Examination may take any course for an S/U grade with the exception of any course that the student's Departmental or Ph.D. Qualifying Examination Committee stipulates must be taken in order to remove a deficiency. It is strongly recommended that all MAE graduate students take a minimum of two courses (other than research) per academic year after passing the Departmental Qualifying Examination. Specific details in this regard can be obtained from the MAE Student Affairs Office.

Doctoral Examinations: An MAE Ph.D. student is required to pass three examinations. The first is a **Departmental Qualifying Examination (DQE)** which is intended to determine the candidate's ability to successfully pursue a research project level appropriate for the doctorate. This first exam must be taken within the first six quarters of registration as a graduate student. The DQE is an oral examination by a committee of four persons (two of which must be in the MAE department) and is based on material taught over 36 units in three areas of study: a major area (four courses), a minor area (two introductory courses), and a study in mathematics or basic science (three courses). Students must submit a plan of study, approved by their adviser, to the Graduate Affairs Committee for final approval by the end of their second quarter of graduate study.

The Teaching Experience is required of all MAE Ph.D. students prior to taking the Ph.D. Qualifying Exam. The teaching experience is defined as lecturing one hour per week in either a problem-solving section or regular lecture for one quarter in a course designated by the department. The requirement can be fulfilled by teaching assistant service or taken as a course for academic credit (MAE 501). Students must contact the Student Affairs Office to plan for completion of this requirement.

The **Ph.D. Qualifying Examination** is the second examination required of MAE Ph.D. students. In preparation for the Ph.D. Qualifying Examination, students must have completed the Departmental Qualifying Examination and the Departmental Teaching Experience requirement, obtained a faculty research adviser, and have identified a topic for their dissertation research and have made initial progress. At the time of application for advancement to candidacy, a doctoral committee responsible for the remainder of the student's graduate program is appointed by the Graduate Council. The committee conducts the Ph.D. Qualifying Examination, during which students must demonstrate the ability to engage in dissertation research. This involves the presentation of a plan for the dissertation research project. The committee may ask questions directly or indirectly related to the project and general questions that it determines to be relevant. Upon successful completion of this examination, students are advanced to candidacy and are awarded the Candidate in Philosophy degree (see "Graduate Studies" section in this catalog).

The **Dissertation Defense** is the final Ph.D. examination. Upon completion of the dissertation research project, the student writes a dissertation that must be successfully defended in an oral examination and public presentation conducted by the doctoral committee. A complete copy of the student's dissertation must be submitted to each member of the doctoral committee approximately four weeks before the defense. It is understood that this copy of the dissertation given to committee members will not be the final copy, and that the committee members may suggest changes in the text at the time of the defense. This examination may not be conducted earlier than three quarters after the date of advancement to doctoral candidacy. Acceptance of the dissertation by the Office of Graduate Studies and Research and the university librarian represents the final step in completion of all requirements for the Ph.D.

There is no formal foreign language requirement for doctoral candidates. Students are expected to master whatever language is needed for the pursuit of their own research.

Ph.D. Time Limit Policy. Pre-candidacy status is limited to four years. Doctoral students are eligible for university support for six years (engineering physics, seven years). The defense and submission of the doctoral dissertation must be within seven years (engineering physics, eight years).

Evaluations. In the spring of each year, the faculty evaluate each doctoral student's overall performance in course work, research, and prospects for financial support for future years. A written assessment is given to the student after the evaluation. If a student's work is found to be inadequate, the faculty may determine that the student cannot continue in the graduate program.

Joint Doctoral Program with San Diego State University

The Department of Mechanical and Aerospace Engineering at UCSD participates in a joint doctoral

program with the Graduate Group in Applied Mechanics at SDSU. The program leads to the degree of doctor of philosophy in engineering sciences (applied mechanics). Participants in the program are required to spend one year enrolled at UCSD; their dissertation research is carried out under the supervision of an SDSU faculty member.

Information regarding admission may be obtained from the departmental Student Affairs Office.

The Graduate Curriculum in Chemical Engineering

The Chemical Engineering (CENG) graduate program is an interdepartmental program and is described more completely under the Chemical Engineering Program in this catalog.

COURSES

All students enrolled in MAE courses or admitted to an MAE program are expected to meet prerequisite and performance standards, i.e., students may not enroll in any MAE courses or courses in another department which are required for the major prior to having satisfied prerequisite courses with a C– or better. (The department does not consider D or F grades as adequate preparation for subsequent material.) Additional details are given under the various program outlines, course descriptions, and admission procedures for the Jacobs School of Engineering in this catalog. Furthermore, the majority of MAE courses have enrollment restrictions which give priority to or are open only to declared pre-engineering students and/or to students who have been admitted to an MAE major. Where these restrictions apply, the registrar will not enroll other students except by department stamp on class enrollment cards. The department expects that students will adhere to these policies of their own volition and enroll in courses accordingly. Students are advised that they may be dropped at any time from course rosters if prerequisites and/or performance standards have not been met.

While most lower-division courses are offered more than once each year, many MAE upper-division courses are taught only once per year, and courses are scheduled to be consistent with the curricula as shown in the tables. When possible, MAE does offer selected large enrollment courses more than once each year.

LOWER-DIVISION

MAE 01. Introduction to Mechanical and Aerospace Engineering (4)
A general introduction to the various specialties in mechanical engineering using analysis of a specified system. Performance prediction using engineering analysis. Performance testing and post-test evaluation. A discussion of the role of engineers in research, design and development, testing, management, teaching. Professional ethics. *Prerequisite: MAE majors only.*

MAE 02. Introduction to Aerospace Engineering (4)
An introduction to topics in aeronautical and astronautical engineering including aerodynamics, propulsion, flight mechanics, structures, materials, orbital mechanics, design, mission planning, and environments. General topics include historical background, career opportunities, engineering ethics, and professionalism. *Prerequisite: none.*

MAE 03. Introduction to Engineering Graphics and Design (4)
Introduction to design process through a hands-on design project performed in teams. Topics include problem identification, concept generation, project management, risk reduction. Engineering graphics and communication skills are introduced in the areas of: Computer-Aided Design (CAD), hand sketching, and technical communication. *Prerequisite: grade of C– or better in Physics 2A or 4A (or concurrent enrollment).* Priority enrollment given to engineering majors.

MAE 05. Quantitative Computer Skills (4)
Introductory course for non-engineering majors. Use of computers in solving problems; applications from life sciences, physical sciences, and engineering. Students run existing computer programs and complete some programming in BASIC. *Prerequisite: none.*

MAE 09. C/C++ Programming (4)
C/C++ computer programming under the UNIX environment with applications to numerical problems fundamental to computational mechanics. Arithmetic operations, branches, arrays, data structures, and use of pointers are introduced. Programming ethics are discussed. Priority enrollment given to pre-engineering and engineering majors.

MAE 10. FORTRAN for Engineers (4)
FORTRAN 90 computer programming under UNIX environment with applications to numerical problems relevant to engineering applications. Arithmetic operations, control constructs, subprograms, arrays and array processing. Input/Output handling and some advanced features of FORTRAN 90 are introduced. Programming ethics. Priority enrollment given to pre-engineering and engineering majors.

MAE 20. Elements of Materials Science (4)
The structure of materials: metals, ceramics, glasses, semiconductors, superconductors and polymers. Control of internal structure to produce desired properties. Mechanical, rheological, electrical, optical, superconducting and magnetic properties and classification. *Prerequisites: Phys. 2A or 4A, Chem. 6A, Math. 21C or 20D (or concurrent registration).*

MAE 87. Freshman Seminar (1)
The Freshman Seminar program is designed to provide new students with the opportunity to explore an intellectual topic with a faculty member in a small seminar setting. Freshman seminars are offered in all campus departments and undergraduate colleges, and topics vary from quarter to quarter. Enrollment is limited to fifteen to twenty students, with preference given to entering freshmen. *Prerequisite: none.*

MAE 90. Undergraduate Seminar (1)
Selected topics of interest to the faculty will be used to introduce students to engineering science. *Prerequisite: none.* Not open to upper-division students.

UPPER-DIVISION

MAE 101A. Introductory Fluid Mechanics (4)
Fluid statics; fluid kinematics; integral and differential forms of the conservation laws for mass, momentum and energy; Bernoulli equation; potential flows; dimensial analysis and similitude. *Prerequisites: admission to an engineering major and grades of C– or better in Phys. 2A, Math. 20D, 20E.*

MAE 101B. Advanced Fluid Mechanics (4)
Laminar and turbulent flow. Pipe flow including friction factor. Boundary layers, separation, drag, and lift. Compressible flow including shock waves. Professional ethics will be discussed. *Prerequisite: admission to an engineering major and grade of C– or better in MAE 101A and MAE 110A.*

MAE 101C. Heat Transfer (4)
Extension of fluid mechanics in MAE 101A-B to viscous, heat-conducting flows. Application of the energy conservation equation to heat transfer in ducts and external boundary layers. Heat conduction and radiation transfer. Heat transfer coefficients in forced and free convection. Design applications. *Prerequisite: admission to an engineering major and grade of C– or better in MAE 101A-B.*

MAE 104. Aerodynamics (4)
Basic relations describing flow field around wings and bodies at subsonic and supersonic speed. Thin-wing theory. Slender-body theory. Formulation of theories for evaluating forces and moments on airplane geometries. Application to the design of high-speed airplanes. *Prerequisites: admission to the engineering major and grade of C– or better in MAE 101A-B.*

MAE 105. Introduction to Mathematical Physics (4)
Fourier series, Sturm Liouville theory, elementary partial differential equations, integral transforms with applications to problems in vibration, wave motion, and heat conduction. *Prerequisites: admission to engineering major or and grades of C– or better in Phys. 2A-B and Math. 20D or Math. 21D.*

MAE 107. Computational Methods in Engineering (4)
Introduction to scientific computing and algorithms; iterative methods, systems of linear equations with applications; nonlinear algebraic equations; function interpolation and differentiation and optimal procedures; data fitting and least-squares; numerical solution of ordinary differential equations. *Prerequisites: engineering majors only and grades of C– or better in MAE 9 or MAE 10 and Math. 20F.*

MAE. 110A. Thermodynamics (4)
Fundamentals of engineering thermodynamics: energy, work, heat, properties of pure substances, first and second laws for closed systems and control volumes, gas mixtures. Application to engineering systems, power and refrigeration cycles, combustion. *Prerequisites: grades of C- or better in Phys. 2C and Chem 6A.* Enrollment restricted to engineering majors only.

MAE 110B. Thermodynamic Systems (4)
Thermodynamic analysis of power cycles with application to combustion driven engines: internal combustion, diesel, and gas turbines. Thermodynamics of mixtures and chemical and phase equilibrium. Computational methods for calculating chemical equilibrium. *Prerequisite: grade of C– or better in MAE 110A.*

MAE 113. Fundamentals of Propulsion (4)
Compressible flow, thermodynamics, and combustion relevant to aircraft and space vehicle propulsion. Analysis and design of components for gas turbines, including turbines, inlets, combustion chambers and nozzles. Fundamentals of rocket propulsion. *Prerequisites: admission to engineering major and grades of C– or better in MAE 110A or CENG 102 and MAE 101A-B-C or CENG 101A-B-C (formerly CENG 103A-B-C).*

MAE 117A. Elementary Plasma Physics (4)
(Cross-listed with Physics 151.) Particle motions, plasmas as fluids, waves, diffusion, equilibrium and stability, nonlinear effects, controlled fusion. *Prerequisites: MAE 117A. Math. 21D or consent of instructor. Phys. 100B-C or ECE 107 are suggested.*

MAE 117B. Industrial Plasma Applications (4)
Charged particle motion in DC and RF electro-magnetic; atomic processes in plasmas; ionization, excitation, dissociation, rate constants, electron energy balance electric breakdown of the gases; debye length, plasmas quasi-neutrality, sheath; DC, capacitive, inductive, and wave-heated discharges; etching, deposition, and implantation. *Prerequisites: Phys. 100B-C or ECE 107 or consent of instructor; Math. 21D.*

MAE 117L. Elements of Experimental Plasma Physics (4)
Measurements of electron density and temperature with the lengmuire probes, emission spectroscopy measurements of neutrals and ions in plasmas; electric breakdown of the gases; plasmas etching of materials. *Prerequisites: none.*

MAE 118A. Energy: Non-Nuclear Energy Technologies (4)
Oil recovery from tar sands and oil shale. Coal production, gasification, liquefaction. The hydrogen economy. Energy storage systems. Techniques for direct energy conversion. Solar energy utilization. Hydroelectric power generation. Hydrothermal energy. Geothermal energy from hot rocks. Electrical power production, transmission, and distribution. *Prerequisite: consent of instructor.*

MAE 118B. Energy: Nuclear Energy Technologies (4)
A brief survey of energy demands and resources. Available nuclear energy, background in atomic and nuclear physics; fission and fusion processes, physics of fission reactions—engineering aspects—safety and environmental effects, fusion-including laser fusion and magnetic confinement, and nuclear power economics. *Prerequisite: consent of instructor.*

MAE 118C. Introduction to Fusion Science and Technologies (4)
Overview of basic fusion processes, high-temperature plasma characteristics, and fusion power plant features. Reaction rates and energy balance for burning fusion plasmas. Survey of the enabling technologies for practical fusion and related applications outside of fusion, such as plasma-material interactions, plasma heating, high heat flux engineering, superconductivity, advanced materials, and nuclear technology. *Prerequisites: MAE 101A or CENG 103A or CENG 101A and either Physics 100B, 100C, ECE 107, or their equivalent.*

MAE 120. Dynamics of Natural Flows (4)
Description of atmosphere and oceans; hydrological cycle. Dynamics of stratified and rotating flows. Surface and interfacial waves; the solitary wave, hydraulic flows. Flow over topography. Gravity currents. Stratified withdrawal. Applications to river flow, estuaries, atmosphere-ocean system, water treatment, reservoir management. *Prerequisites: MAE 101B and MAE 105 with a grade of C– or better.*

MAE 121. Convective Flows in the Environment (4)
Convection and the Rayleigh number. Plumes and thermals relation to atmospheric boundary layer and ocean mixed layer. Effects of rotation. Katabatic flows. Fires and clouds. Double-diffusive convection with oceanographic and industrial applications; solar ponds. *Prerequisites: MAE 101B and MAE 105 with a grade of C– or better.*

MAE 122. Air Pollution Modeling (4)
Fickian diffusion; advection-diffusion equation. Turbulent dispersion and eddy diffusivities. Gaussian plume models for passive scalars; entrainment. Concepts of buoyancy and momentum fluxes. Similarity theory of the atmospheric boundary layer. Current practices and regulations. Experience with air dispersion software. *Prerequisites: MAE 101B and MAE 105 with a grade of C– or better.*

MAE 123. Fluid-Solid Interactions in Environmental Engineering (4)
Fundamentals of adsorption and surface reactions, and processes in porous media and packed beds (diffusion/dispersion/flow coupled with adsorption/reaction). Examples include reactions on atmospheric particulates, reactions on ice crystals in the polar atmosphere and effect on ozone, transport of contaminant plumes in groundwater, and remediation processes such as catalytic destruction of air pollutants. *Prerequisite: consent of instructor.*

MAE 124. The Human Earth: An Introduction to Environmental Engineering and Policy (4)
(Cross-listed with ESYS 103.) This course explores the impacts of human social, economic, and industrial activity on the environment. It highlights the central roles in ensuring sustainable development played by market forces, technological innovation and governmental regulation on local, national, and global scales. *Prerequisites: grade of C– or better in Math. 20B or Math. 10A-C; Phys. 2B or Phys. 1A-C; and Chem. 6B or by consent of instructor.*

MAE 125A. Flow and Transport in the Environment (4)
Study of river flow and hydraulic control; surface waves; applications to reservoirs and estuaries. Introduction to stratification and buoyancy; applications to atmospheric surface layer and the ocean mixed layer. Ideas behind turbulent dispersion. Turbulent and scaling laws. Gravity currents and katabatic flows. *Prerequisites: engineering majors and students receiving a grade of C– or better in MAE 101A or CENG 103A or CENG 101A.*

MAE 125B. Fluid-Solid Interactions in Environment Engineering (4)
Introduction to groundwater flow. Pollution transport through the water table. Chemical processes in ozone hole. Fundamentals of flow. Darcy flow. Diffusion and dispersion. Gravity currents and plumes in porous media. Mushy layers. Chemistry of fluid-solid interactions. Fundamentals of adsorption and surface reactions. *Prerequisites: engineering majors and students receiving a grade of C– or better in MAE 125A.*

MAE 125C. Case Studies In Environmental Engineering (4)
This course is project-oriented. Students will conduct research in small groups, give oral presentations and write reports. Topics reflect material in MAE 125A and MAE 125B. Possible topics: air pollution modeling, building ventilation, wetland preservation. *Prerequisites: engineering majors and student receiving a grade of C– or better in MAE 125A-B.*

MAE 126A. Environmental Engineering Laboratory I (4)
Design and analysis of experiments in environmental engineering. Experiments in wind tunnel, water tunnel, and other equipment. Use of instrumentation. Laboratory report writing; error analysis; engineering ethics. *Prerequisites: grade of C– or better in MAE 101A, MAE 125A-B.*

MAE 126B. Environmental Engineering Laboratory II (4)
Design and analysis of original studies in environmental engineering. Students work on environmental projects and use computational and laboratory facilities. Students propose and design studies, collect and analyze data, and prepare a major report. *Prerequisite: grade of C– or better in MAE 126A.*

MAE 130A. Mechanics I: Statics (4)
(Cross-listed with SE 101A) Principles of statics using vectors; two and three-d equilibrium of statically determinate structures under discrete and distributed loading including hydrostatics; internal forces and concepts of stress; free body diagrams; moment, product of inertia; analysis of trusses and beams. *Prerequisites: Math. 21C and Phys. 2A with grades of C– or better.* Students cannot also receive credit for SE 101A.

MAE 130B. Mechanics II: Dynamics (4)
(Cross-listed with SE101B) Kinematics and kinetics of particles in 2-D and 3-D motion by using vector representation. Orbital mechanics. Work, energy, and power. Conservative forces, conservation principles. Momentum, impulsive motion and impact. Rigid body kinetics and kinematics; Coriolis acceleration, eulerian angles. Undamped vibrating systems. *Prerequisites: Math. 20D and MAE 130A or SE 101A with grades of C– or better.* Student cannot also receive credit for SE 101B.

MAE 130C. Mechanics III: Vibrations (4)
Free and forced vibrations of damped one-degree of freedom systems. Matrix representation of discrete multiple degree of freedom systems. Use of Matlab for both modal analyses and response analyses of systems subjected to impulse and step loading. Lagrange's equations. Modal superposition for analysis of continuous vibrating systems with applications to structures. *Prerequisites: admission to the engineering major and grades of C– or better in Math. 20F and MAE 130B or SE 101B.*

MAE 131A. Fundamentals of Solid Mechanics I (4)
Stress and strain, generalized Hooke's law. Mechanics of deformable bodies under torsional, shearing and bending loads. Deflection of beams. Stability of columns. St. Venant's semi-inverse torsion analysis. Strain energy and energy principles. Design of statically indeterminate rods, shafts, beams and columns. Professional ethics. *Prerequisites: admission to the engineering major and Grades of C– or better in Math. 20D or 21D, 20F; and MAE 130A or SE 101A.*

MAE 131B. Fundamentals of Solid Mechanics II (4)
Continuum mechanics of solids and its application to the mechanical response of machine and structural elements. Stress and strain in indicial notation; field equations and constitutive relations. Linear elastic

stress analysis in torsion, plane stress and plane strain; stress concentrations; fracture mechanics. Extremum principles and structural stability. Viscoelasticity, plasticity, and failure criteria. Theorems of plastic limit analysis. *Prerequisites: admission to the engineering major and grades of C– or better in MAE 131A, and MAE 105 (or concurrent enrollment).*

MAE 131C. Solid Mechanics III (4)
Small deflection theory of plates. Solutions for rectangular and circular plates. Buckling of rectangular plates. Large deflections and shear deformations. Energy methods and finite element method of analysis. *Prerequisites: admission to the engineering major and grade of C– or better in MAE 131A.*

MAE 133. Finite Element Methods in Mechanical and Aerospace Engineering (4)
Development of stiffness and mass matrices based upon variational principles and application to static, dynamic, and stability design problems in structural and solid mechanics. Architecture of computer codes for linear and nonlinear finite element analysis and basic computer implementation. The use of general purpose finite element structural analysis computer codes. *Prerequisites: admission to the engineering major and grades of C– or better in MAE 131AB and MAE 107.*

MAE 135. Computational Mechanics (4)
Mathematical modeling in terms of systems of algebraic and differential equations. Overview of numerical methods. Problem statement, boundary, and initial conditions. Overview of commerical packages for solving the equations of Mathematical and Engineering Physics. Numerical solutions of selected examples drawn from real-life applications of fluid flow, solid mechanics, and heat transfer with emphasis on design. *Prerequisite: consent of instructor.*

MAE 137. Technical Writing for Engineers (2)
Writing techniques for clear and effective presentation of technical information and ideas. Fundamentals of editing through peer review under instructor guidance. Several short papers on technical topics will be assigned. Students must complete college writing requirement(s) prior to taking this course. *Prerequisites: completion of College Writing Program with a grade of C– or better (HUM 5 or MCWP 50 or DOC 3 or WARR 10B or MMW 6 or 6H).*

MAE 140. Linear Circuits (4)
Steady-state and dynamic behavior of linear, lumped-parameter electrical circuits. Kirchoff's laws. RLC circuits. Node and mesh analysis. Operational amplifiers. Signal acquisition and conditioning. Electric motors. Design applications in engineering. *Prerequisites: admission to the engineering major and grades of C– or better in Math. 20D, and Phys. 2B.*

MAE 142. Dynamics and Control of Aerospace Vehicles (4)
The dynamics of vehicles in space or air are derived for analysis of the stability properties of spacecraft and aircraft. The theory of flight, lift, drag, dutch roll and phugoid modes of aircraft are discussed. Optimal state space control theory for the design of analog and digital controllers (autopilots). *Prerequisites: admission to the engineering major and grades of C– or better in MAE 104 and MAE 141A or MAE 143B or ECE 171A.*

MAE 143A. Signals and Systems (4)
First-order vector ordinary differential equations, concepts of state, input and output. Linearity and linearization concepts introduced with solutions. Laplace and Fourier transforms are defined for signals. Transfer functions and frequency responses for systems. Spectra and filtering for deterministic signals, probability and statistics of random signals and treatment. *Prerequisites: admission to MAE or bioengineering major and grade of C– or better in Math. 20E, 20F, and 20D.*

MAE 143B. Linear Control (4)
Analysis and design of feedback systems in the frequency domain. Transfer functions. Time response specifications. PID controllers and Ziegler-Nichols tuning. Stability via Routh-Hurwitz test. Root locus method. Frequence response: Bode and Nyquist diagrams. Dynamic compensators, phase-lead and phase-lag. Actuator saturation and integrator wind-up. *Prerequisite: grade of C– or better in MAE 143A.*

MAE 143C. Digital Control Systems (4)
Discrete time systems: sampling. aliasing, stability, Z-transform, discrete time signals, state space models; state equations, canonical forms, observability, controllability. Pole placement design, observer design, output feedback, linear quadratic regulator design. Implementation: digital approximation, computational and numerical issues. *Prerequisite: grade of C– or better in MAE 143B.*

MAE 149. Sensor Networks (4)
(Cross-listed with ECE 156 and SIO 238.) Focus on the characteristics of chemical, biological, seismic, and other physical sensors; signal-processing techniques supporting disbtributed detection of salient events; wireless communication and networking protocols supporting formation of robust sensor fabrics; current experience with low power, low cost sensor deployments. Undergraduates will be given a final exam. Graduates will be required to complete a term-paper or formal project. *Prerequisites: upper-division standing and consent of instructor, or graduate student in science or engineering.*

MAE 150. Computer-Aided Design (4)
Computer-Aided Analysis and Design. Design methodology, tolerance analysis, Monte Carlo analysis, kinematics and computer-aided design of linkages, numerical calculations of moments of inertia, design of cams and cam dynamics; finite element analysis, design using Pro-E, Mechanica Motion and Mechanica Structures. *Prerequisites: grade of C– or better in MAE 130A or SE 101A; BENG 110, and MAE 107.*

MAE 152. Computer Graphics for Engineers and Scientists (4)
Computer graphics algorithms using C programming and Ironcad. Applications in engineering and science. Line-drawing algorithms. Area fill algorithms, color, CAD user interface, spline curves and surfaces, 2-D and 3-D transformations, wireframe and solid models. Hidden-surface elimination. *Prerequisities: grade of C– or better in MAE 3 and MAE 9 or 10.*

MAE 155A. Aerospace Engineering Design I (4)
Fundamental principles of aerospace design. Application of engineering mechanics to the design of aerospace components. Design and analysis of aerospace components and assemblies. *Prerequisites: grade of C– or better in MAE 104, 113, 130C, 142, 150, SE 2 and SE 160B. Students may enroll concurrently with MAE 113 and 142.*

MAE 155B. Aerospace Engineering Design II (4)
Fundamental principles of aerospace design. Application of engineering mechanics to the design of aerospace components. Design, manufacture and assemble projects involving preliminary design for a realistic engineering application. *Prerequisites: grade of C– or better in MAE 130C, 150, 155A.*

MAE 156A. Fundamental Principles of Mechanical Design I (4)
Fundamental principles of mechanical design and the design process. Application of engineering science to the design and analysis of mechanical components. Initiation of team design projects that culminate in MAE 156B with a working prototype designed for a real engineering application. *Prerequisite: grade of C– or better in MAE 101C, MAE 130C, MAE 131A, MAE 150, MAE 160, and MAE 170.*

MAE 156B. Fundamental Principles of Mechanical Design II (4)
Fundamental principles of mechanical design and the design process. Culmina-tion of a team design project initiated in MAE 156A which results in a working prototype designed for a real engineering application. *Prerequisite: grade of C– or better in 156A in the immediately preceding quarter, MAE 101C, MAE 150.*

MAE 160. Mechanical Behavior of Materials (4)
Elasticity and anelasticity, dislocations and plasticity of crystals, creep, and strengthening mechanisms. Mechanical behavior of ceramics, composites, and polymers. Fracture: mechanical and microstructural. Fatigue. Laboratory demonstrations of selected topics. *Prerequisites: grades of C– or better in MAE 20, MAE 130A (or SE 101A) and MAE 131A.*

MAE 161. Electronic, Magnetic, and Photonic Materials (4)
Introduction to the worlds of electronic, magnetic/photonic materials, the unique properties of advance engineering materials in relation to processing, fabrication, and microstructure. Semiconductors, metals, alloys, ceramics, polymers, and composite materials and their practical applications. *Prerequisite: consent of instructor.*

MAE 162. Advanced Materials: Processing, Selection and Design (4)
Introduction to various techniques used in fabricating useful bodies with optimal structural, magnetic, optical, or electronic properties. Influence of the type of raw material, densification techniques and methods to tailor composition and microstructure. Ceramics, metals, semiconductors, and composites will be discussed. *Prerequisite: MAE 160 or consent of instructor.*

MAE 163. Mechanics of Porous Materials (4)
Powder packing structures. Fundamentals of the continuum mechanics of powder deformation, plasticity of porous materials. Micromechanical models. Review of main methods of powder shaping, synthesis and manufacturing of high density structures: cold consolidation, forging, rolling, sintering, uniaxial hot pressing, hot isostatic compaction (HIP), extrusion, injection molding. *Prerequisite: consent of instructor.*

MAE 165. Fatigue and Failure Analysis of Engineering Components (4)
The engineering and scientific aspects of crack nucleation, slow crack growth, and unstable fracture in crystalline and amorphous solids. Microstructural effects on crack initiation, fatigue crack growth and fracture toughness. Methods of fatigue testing and fracture toughness testing. Fractography and microfractography. Design safe methodologies and failure prevention. Failure analysis of real engineering structures. *Prerequisite: consent of instructor.*

MAE 166. Nanomaterials (4)
Basic principles of synthesis techniques, processing, microstructural control and unique physical properties of materials in nano-dimensions. Nanowires, quantum

dots, thin films, electrical transport, optical behavior, mechanical behavior, and technical applications of nanomaterials. *Prerequisite: consent of instructor.*

MAE 167. Wave Dynamics in Materials (4)
Pressure and shear waves in infinite solids. Reflection and diffraction. Rayleigh and Love waves in semi-infinite space. Impulse load on a half space. Waveguides and group velocity. *Prerequisite: consent of instructor.*

MAE 168. MEME Materials, Fabrication, and Applications (4)
The principles of micro-electro-mechanical systems (MEMS) fabrication, materials involved, actuation principles utilized, and the fundamentals of MEMS operation in relation to stresses and deformation. Novel device applications, future trends, and nano-electro-mechanical (NEMS) systems. *Prerequisite: consent of instructor.*

MAE 170. Experimental Techniques (4)
Principles and practice of measurement and control and the design and conduct of experiments. Technical report writing. Lectures relate to dimensional analysis, error analysis, signal-to-noise problems, filtering, data acquisition and data reduction, as well as background of experiments and statistical analysis. Experiments relate to the use of electronic devices and sensors. *Prerequisite: Grade of C– or better in Phys. 2CL and admission to any engineering major.*

MAE 171A. Mechanical Engineering Laboratory I (4)
Design and analysis of experiments in fluid mechanics, solid mechanics, and control engineering. Experiments in wind tunnel, water tunnel, vibration table and material testing machines, and refined electromechanical systems. Laboratory report writing; error analysis; engineering ethics. *Prerequisites: grade of C– or better in MAE 101C (or CENG 103C); MAE 160, MAE 143B, MAE 170, and senior standing in engineering major.*

MAE 171B. Mechanical Engineering Laboratory II (4)
Design and analysis of original experiments in mechanical engineering. Students research projects using experimental facilities in undergraduate laboratories: wind tunnel, water channel, vibration table, and testing machine and control systems. Students propose and design experiments, obtain data, complete engineering analysis and write a major report. *Prerequisite: requires a grade of C– or better in MAE 171A.*

MAE 175A. Aerospace Engineering Laboratory I (4)
Analysis of aerospace engineering systems using experimental facilities in undergraduate laboratories: wind tunnel, water channel, vibration table, and testing machine. Students operate facilities, obtain data, complete engineering analysis and write major reports. *Prerequisites: senior standing in engineering major and grade of C– or better in MAE 101C or CENG 103C or CENG 101C; MAE 141A or MAE 143B, MAE 170.*

MAE 175B. Aerospace Engineering Laboratory II (4)
Design and analysis of original experiments in aerospace engineering. Students research projects using experimental facilities in undergraduate laboratories: wind tunnel, water channel, vibration table, testing machine and control systems. Students propose and design experiments, obtain data, complete engineering analysis and write a major report. *Prerequisite: requires a grade of C– or better in MAE 175A.*

MAE 180A. Space Science and Engineering I (4)
Introduction to space science. Earth, planetary atmospheres, especially upper atmospheres. Magnetospheres, energetic particles. Electro-magnetic spectrum. Atmospheric attenuation, windows. Detection methods, instruments. Imaging systems, image processing. Observations from space. Newtonian mechanics of bound orbits. Science on manned, unmanned missions. *Prerequisite: upper-division standing in physics, chemistry, or engineering department.*

MAE 180B. Space Science and Engineering II (4)
Introduction to space engineering. Kinematics of rockets. Types of rocket engines. Relation of engine performance and rocket characteristics to mission phases—takeoff, on-orbit maneuvers, reentry, and landing. Space structures and materials, with emphasis on new developments. Fabrication of structures from materials obtained in space. Communication systems: design characteristics, requirements, performance. Robotics and control. Tethers. Astrodynamics. *Prerequisite: upper-division standing in physics, chemistry or engineering department.*

MAE 191. Topics in Engineering Science (4)
Course to be given at the discretion of the faculty in which topics of current interest in engineering will be presented by visiting or resident faculty members. *Prerequisite: consent of instructor.*

MAE 195. Teaching (2-4)
Teaching and tutorial assistance in an MAE course under supervision of instructor. Not more than four units may be used to satisfy graduation requirements. P/NP grades only. *Prerequisites: junior status and a B average in major and consent of department chair.*

MAE 197. Engineering Internship (1-4)
Coordinated through UCSD Academic Internship Program, this course provides work experience through industry, government offices, hospitals and their practices. Students will work in local industry or hospital under faculty supervision. Units may not be applied toward major graduation requirements. Internship is unsalaried. *Prerequisites: completion of ninety units with 2.5 GPA and consent of faculty adviser.*

MAE 198. Directed Group Study (1-4)
Directed group study on a topic or in a field not included in the regular department curriculum, by special arrangement with a faculty member. May be taken P/NP only. *Prerequisite: consent of instructor.*

MAE 199. Independent Study for Undergraduates (4)
Independent reading or research on a problem by special arrangement with a faculty member. P/NP grades only. *Prerequisite: consent of instructor.*

GRADUATE COURSES

205. Graduate Seminar (1)
Each graduate student in MAE is expected to attend one seminar per quarter, of his or her choice, dealing with current topics in fluid mechanics, solid mechanics, applied plasma physics and fusion, chemical engineering, applied ocean sciences, energy and combustion, environmental engineering, or materials science, and dynamics and controls. Topics will vary. (S/U grades only)

207. Topics in Engineering Science (4)
A course to be given at the discretion of the faculty in which topics of current interest in engineering will be presented. *Prerequisite: consent of instructor.*

209. Continuum Mechanics Applied to Medicine/Biology (4)
(Cross-listed with BENG 209.) Introduction to the basic definitions of continuum mechanics and their mathematical formulation at the graduate level with applications to problems in medicine and biology. This course is intended for students with little or no background in mechanics; it is an introduction to the Biomechanics courses BENG 250 A-B in the Department of Bioengineering and to Solid and Fluid Mechanics courses MAE 210A and MAE 231A in the Department of Mechanical and Aerospace Engineering. This course should NOT be taken concurrently with MAE 210 or MAE 231A. *Prerequisite: consent of instructor.*

210A. Fluid Mechanics I (4)
(Cross-listed with CENG 210A.) Basic conservation laws. Flow kinematics. The Navier-Stokes equations and some of its exact solutions. Non-dimensional parameters and different flow regimes, vorticity dynamics. *Prerequisites: MAE 101A-B and MAE 110A, or consent of instructor.*

210B. Fluid Mechanics II (4)
Potential flows, boundary layers, low-Reynolds number flows. *Prerequisites: MAE 210A, MAE 101A-B, and MAE 110A, or consent of instructor.*

210C. Fluid Mechanics III (4)
Flow instabilities, linear stability theory; introduction to turbulent flows. *Prerequisites: MAE 210A-B, MAE 101A-B, and MAE 110A, or consent of instructor.*

211. Introduction to Combustion (4)
Fundamental aspects of flows of reactive gases, with emphasis on processes of combustion, including the relevant thermodynamics, chemical kinetics, fluid mechanics, and transport processes. Topics may include deflagrations, detonations, diffusion flames, ignition, extinction, and propellant combustion. *Prerequisites: MAE 101A-B-C or CENG 103A-B-C, MAE 110A, or consent of instructor.*

212. Introductory Compressible Flow (4)
Equations of motion for compressible fluids; one-dimensional gas dynamics and wave motion, waves in supersonic flow, including oblique shock waves; flow in ducts, nozzles, and wind tunnels; methods of characteristics. *Prerequisites: MAE 101A-B-C or CENG 103A-B-C, MAE 110A, or consent of instructor.*

213. Mechanics of Propulsion (4)
Fluid mechanics, thermodynamics and combustion processes involved in propulsion of aircraft and rockets by air breathing engines, and solid and liquid propellant rocket engines characteristics and matching of engine components; diffusers, compressors, combustors, turbines, pumps, nozzles. *Prerequisites: MAE 101A-B-C, MAE 110A, or consent of instructor.*

214A. Introduction to Turbulence and Turbulent Mixing (4)
Basic features of turbulent flows. Analytical description of turbulence: random variables, correlations, spectra, Reynolds-averaging, coherent structures. Length and time scales. Kolomogorov similarity theory. Turbulence transport equations. Free shear flows. Homogeneous turbulence. Wall-bounded flows. Mixing of velocity and scalar fields. *Prerequisites: MAE 210A, MAE 101A,B or equivalent or consent of instructor.*

214B. Ocean Turbulence and Mixing (4)
(Cross-listed with SIO 213.) Mixing mechanisms, their identification, description and modeling. Introduction to turbulence, semi-empirical theories, importance of coherent structures, effects of stratification and rotation on turbulent structure, entrainment and mixing. S/U grades permitted.

215. Hydrodynamic Stability (4)
Kelvin-Helmholtz instability of shear layers, the Orr-Sommerfeld equation and its solution for inviscid and viscous flows. Taylor instability of circular Couette flows; finite amplitude stability; chaos; transition to turbulence. *Prerequisite: MAE 210A-C or equivalent.*

217. Introduction to Plasma Equilibria, Waves, and Instabilities (4)
Plasma kinetic theory. Two fluid and MHD descriptions of plasmas. Plasma equilibrium configurations and macroscopic stability. Waves in plasmas, collisional and landau damping. Microscopic plasma instabilities. Amomalous cross field plasma transport. Nonlinear wave processes; parametric instabilities, self focusing, solitons. *Prerequisite: none*

218A. Physics of Gas Discharge Plasmas and Appplications (4)
Charged particle motion in electro-magnetic field. Atomic processes in plasmas. Electric breakdown of the gases, plasma quasineutrality, weakly ionized plasma particle and energy fluxes, sheath. Electron kinetics, DC and RF driven discharges, plasma instabilities. Etching, deposition, implantation, and surface modification. *Prerequisite: Physics 100 (B-C) or ECE 107 or equivalent.*

220A. Physics of Gases (4)
Thermodynamics of gases for use in gasdynamics. Derivation of thermodynamic functions from statistical mechanics. Applications of classical and quantum statistical mechanics to chemical, thermal, and radiative properties of gases. Equilibrium and nonequilibrium radiation, chemical equilibrium, and elements of chemical kinetics. Laser and reacting-flow applications. *Prerequisite: MAE 110A or consent of instructor.*

220B. Physical Gasdynamics (4)
Velocity distribution functions, the Boltzmann equation, moment equations and the Navier-Stokes equations. The dynamics of molecular collisions. The Chapman-Enskog expansion and transport coefficients: shear and bulk viscosity, heat conduction, molecular and thermal diffusion. Linearizations about equilibrium: applications to acoustics and supersonic flows with relaxation. *Prerequisite: MAE 101A-B-C or CENG 103A-B-C or CENG 101A-B-C, MAE 220A, or consent of instructor.*

221A. Heat Transfer (4)
(Cross-listed with CENG 221A.) Conduction, convection, and radiation heat transfer. Development of energy conservation equations. Analytical and numerical solutions to transport problems. Specific topics and applications vary. *Prerequisite: MAE 101A-B-C or CENG 103A-B-C or CENG 101A-B-C, or consent of instructor.*

221B. Mass Transfer (4)
(Cross-listed with CENG 221B.) Fundamentals of diffusive and convective mass transfer and mass transfer with chemical reaction. Development of mass conservation equations. Analytical and numerical solutions to mass transport problems. Specific topics and applications will vary. *Prerequisite: MAE 101A-B-C or CENG 103A-B-C or CENG 101A-B-C, or consent of instructor.*

222A-B-C. Advanced Fluid Mechanics (4-4-4)
Contemporary problems in broad areas of fluid mechanics, e.g., turbulent flows, hydrodynamic stability, geophysical fluid dynamics, transport phenomena, acoustics, boundary layers, etc. (Not necessarily taught as a sequence nor offered every quarter.) *Prerequisite: MAE 210A-B-C or consent of instructor.*

223. Computational Fluid Dynamics (4)
Numerical methods in fluid dynamics and convective transport processes. Numerical solution of the Euler and Navier-Stokes equation. Additional topics will vary according to instructor. Examples include eigenvalue problems in hydrodynamic stability, vortex methods, spectral and panel methods. *Prerequisite: MAE 210A, 290A-B or equivalent, MAE 107, or consent of instructor.*

224. Environmental Fluid Dynamics (4)
(Cross-listed with SIO 214B.) Single-layer flows with a free surface, two layer flows including exchange flows in harbors, estuaries, seas, and buildings. Continuously stratified flows with meteorological and oceanographic applications. Topographic effects, plumes, jets, and thermals. Planetary boundary layers. *Prerequisites: introductory level graduate course in fluid mechanics.*

227A. Fundamentals of Fusion Plasma Physics (4)
Magnetic and inertial confinement fusion concepts. Magnetic equilibrium configurations and limitations. Classical and anomalous transport of magnetically confined plasmas. Plasma-wall interactions. Rayleigh-Taylor and Richter-Meshkov instabilities. Direct and indirect drive, laser and particle beams. Emerging and alternative concepts. *Prerequisite: none*

227B. Fundamentals of Modern Plasma Physics (4)
Fusion plasma turbulence, magnetic reconnection, strong electromagnetic wave/plasma I interactions, numerical simulations of nonlinear plasma phenomena, issues of plasma astrophysics and space plasmas, plasma based propulsion, plasma boundary layers in fusion devices, plasma chemistry. *Prerequisite: MAE 227A or consent of instructor*

229A. Mechanical Properties (4)
(Cross-listed with MATS 211A.) Review of basic concepts in mechanics of deformation: elasticity, plasticity, viscoelasticity and creep; effects of temperature and strain-rate on inelastic flow; microstructure and mechanical properties; application of basic concepts to selected advanced materials. *Prerequisite: consent of instructor.*

229B. Advanced Mechanical Behavior (4)
(Cross-listed with MATS 211B.) Rate mechanisms in crystaline solids, kinetics and dynamics of plastic flow by slip at low and high strain rates. Mechanisms of inelasticity in non-metals, metals, and polymeric materials. Mechanisms of failure and effects of strain rates. *Prerequisite: MAE 229A or consent of instructor.*

231A. Foundations of Solid Mechanics (4)
Specification of stress and strain; infinitesimal and finite deformation; conservation equations; typical constitutive equations; minimum potential energy principle. *Prerequisite: MAE 131B or consent of instructor.*

231B. Elasticity (4)
Basic field equations. Typical boundary value problems of classical linear elasticity. Problems of plane stress and plane strain. Variational principles. *Prerequisite: MAE 231A or consent of instructor.*

231C. Anelasticity (4)
Mechanical models of viscoelastic, plastic, and viscoplastic behavior in simple shear or uniaxial stress. Constitutive relations for three-dimensional states of stress and strain. Application to selected technological problems. *Prerequisite: MAE 231B or consent of instructor.*

232A. Finite Element Methods in Solid Mechanics I (4)
Finite element methods for linear problems in solid mechanics. Emphasis on the principle of virtual work, finite element stiffness matrices, various finite element formulations and their accuracy and the numerical implementation required to solve problems in small strain, isotropic elasticity in solid mechanics. *Prerequisite: graduate standing.*

232B. Finite Element Methods in Solid Mechanics II (4)
Finite element methods for linear problems in structural dynamics. Beam, plate, and doubly curved shell elements are derived. Strategies for eliminating shear locking problems are introducted. Formulation and numerical solution of the equations of motion for structural dynamics are introduced and the effect of different mass matrix formulations on the solution accuracy is explored. *Prerequisites: graduate standing and MAE 230 or MAE 232A.*

233B. Micromechanics (4)
General theory of transformation strains and corresponding elastic fields; Green's functions and other solution methods; dislocations; inclusions and inhomogeneities; micromechanics of plastic flow, microcracking, cavitation, and damage in crystalline and other solids. *Prerequisite: MAE 231A-B-C or consent of instructor.*

233C. Advanced Mechanics of Composite Materials (4)
Three-dimensional anisotropic constitutive theories, anisotropic fracture mechanics, composite micromechanics, edge effects and interlaminar shear stresses, impact damage and energy absorbing mechanisms, and surface wave. *Prerequiste: MAE 131A-B-C, 231A-B or consent of instructor.*

236. Structural Stability (4)
Static, dynamic, and energy-based techniques and predicting elastic stability. Linear and nonlinear analysis of classical and shear deformable beams and plates. Ritz, Galerkin, and finite element approaches for frames and reinforced shells. Nonconservative aerodynamic (divergence flutter) and follower forces. *Prerequisite: MAE 131B or consent of instructor.*

237. Structural Dynamics (4)
Matrix analysis of the free and forced vibrations of discrete linear systems; response to periodic and transient excitations. Frequency response and generalized normal mode methods. Dynamics of continuous systems. *Prerequisite: MAE 231A-B or consent of instructor.*

238. Stress Waves in Solids (4)
Linear wave propagation; plane waves; reflection and refraction; dispersion induced by geometry and by material properties. Application of integral transform methods. Selected topics in nonlinear elastic, anelastic, and anisotropic wave propagation. *Prerequisite: MAE 231A-B-C or consent of instructor.*

241. Advances in Control Applications (4)
Study of problems of control design, identification, and optimization for flexible and smart structures, fluid flows, propulsion, power generation, vehicle dynamics (aerospace, ocean, and automotive), magnetic recording, semiconductor manufacturing, biological systems, robot manipulations, and other applications. *Prerequisites: MAE 141A or equivalent.*

243. Advances in Two-Phase Flow (4)
Modern developments in understanding of two-phase flows will be reviewed. New experimental methods and new theoretical concepts will be covered, as will potential future practical applications. *Prerequisites: MAE 210A-B-C.*

244. Advanced Simulation and Modeling of Turbulent Flows (4)
Progress in the area of simulation and modeling of turbulent flows will be reviewed. Methods to be covered include: direct simulations, large-eddy simulation, and Reynolds averaged turbulence models. *Prerequisites: MAE 210ABC; MAE 214; MAE 290AB.*

245. Advances in Combustion Theory (4)
Asymptotic analyses of flame structure. Combustion in two phase flows. Turbulent combustion. *Prerequisites: MAE 210AB; MAE 211; MAE 213.*

246. Advances in Engine Combustion (4)
Mathematical models of combustion in diesel engines and spark-ignition engines. Mechanisms of soot formation. *Prerequisites: MAE 210AB; MAE 211; MAE 213.*

247. Advances in Experimental and Theoretical Mechanics of Materials (4)
The focus will be on coordinated experimental evaluation and theoretical modeling of thermal mechanical properties of a broad class of materials. Using state-of-the-art techniques, students will gain hands-on experience with modern experimental tools in the area of mechanics and materials. *Prerequisites: consent of the instructor.*

248. Advances in Magnetic Recording (4)
This course will address recent advances in mechanics, tribology, and materials problems of magnetic recording technology. Of special interest will be the treatment of the head/disk and head/tape interface, the numerical schemes used to model the head/medium interface and advanced tribological phenomena needed to understand this fast developing and changing technology. Additional (guest) lecturers on magnetic recording theory and signal processing will be part of the class. *Prerequisite: none.*

249. Advances in Materials Computations (4)
This course will cover nonlinear finite element methods in large deformations and nonlinear materials. Particular emphasis will be placed on material models that are appropriate for high strain rates, high pressures, and phase transformations. *Prerequisites: MAE 231A, 232A.*

250. Fatigue, Fracture, and Failure Analysis in Engineering Materials (4)
(Cross-listed with MATS 218.) This course will cover the engineering and scientific aspects of fatigue crack initiation, stable crack growth, fatigue life predictions, selection of materials for fatigue applications, fractography, and failure analysis, including case studies. *Prequisite: MAE 160 or consent of instructor.*

251. Structure and Analysis of Solids (4)
(Cross-listed with MATS 227 and Chem. 222.) Key concepts in the atomic structure and bonding of solids such as metals, ceramics, and semiconductors. Symmetry operations, point groups, lattice types, space groups, simple and complex inorganic compounds, structure/property comparisons, structure determination with x-ray diffraction. Ionic, covalent, metallic bonding compared with physical properties. Atomic and molecular orgitals, bands vs. bonds, free electron theory. *Prerequisite: consent of instructor.*

252AB. Processing and Synthesis of Advanced Materials (4)
(Cross-listed with MATS 233A-B.) Introduction to various materials processing techniques used in fabricating dense bodies with optimal structure and properties. Solidification processing, chemical synthesis of ceramics, theory of densification, composite fabrication, superconductor synthesis, electronic and optical materials processing, and techniques to generate amorphons solids. *Prerequisite: consent of instructor.*

253. Ceramic and Glass Materials (4)
(Cross-listed with MATS 236.) Powder synthesis, powder compaction and densification via different processing routes. Phase equilibria and crystallography in ceramic materials. Sintering, liquid and vapor phase processing, and single crystal growth. Control of the microstructural development and interfacial properties optimize properties for structural, thermal, electrical, or magnetic use. Topics in processing and use of advanced ceramic materials. Glass formation and structure, phase separation, viscous flow and relaxation. *Prerequisite: consent of instructor.*

256. Rheology of Fluids (4)
Continuum mechanics of fluids; definition of material functions for viscous and viscoelastic liquids; principles of rheological measurement; relationship to molecular structure. *Prerequisite: consent of instructor.*

261. Sensors and Measurements (4)
Manufacturing sensors and measurement systems, measurement techniques, modern metrology, statistical methods, and experiment design. *Prerequisite: consent of instructor.*

265. Structure and Properties of Electronic, Magnetic, and Photomic Materials (4)
(Cross-listed with MATS 251.) Explores the interplay between the electronic, magnetic and photonic properties of advanced engineering materials in relation to processing, fabrication, and microstructure. Semiconductors, metals, alloys, ceramics, polymers, and composite materials will be studies along with their practical applications. *Prerequisite: consent of instructor.*

266. Biomaterials (4)
(Cross-listed with MATS 252.) This class will cover biomaterials and biomimetic materials. Metal, ceramic, and polymer biomaterials will be discussed. Emphasis will be on the structure-property relationships, biocompatibility/degradation issues and tissue/material interactions. Synthesis and mechanical testing of biomimetic materials will also be discussed. *Prerequisite: consent of instructor.*

267. Nanomaterials and Properties (4)
(Cross-listed with MATS 253.) This course discusses synthesis techniques, processing, microstructural control and unique physical properties of materials in nano-dimensions. Topics include nanowires, quantum dots, thin films, electrical transport, electron emission properties, optical behavior, mechanical behavior, and technical applications of nanomaterials. *Prerequisite: consent of instructor.*

268. MEMS Materials, Fabrication, and Applications (4)
(Cross-listed with MATS 254.) Fabrication of Micro-Electro Mechanical Systems (MEMS) by bulk and surface micromachining of single crystal, polycrystal and amorphous silicon and other materials. Performance issues including electrostatic, magnetic, piezoelectric actuations, residual stresses, deformation. Novel device applications, future trends in smart materials and nano-electro-mechanical (NEMS) systems. *Prerequisite: consent of instructor.*

269. Presentations, Inventions and Patents (4)
(Cross-listed with MATS 255.) This course covers methodology and skills for oral and written presentations. Topics include preparation of presentation materials, presentation exercise, publication manuscripts, research work proposals, understanding and securing of inventions and intellectual properties, patent applications and licensing. *Prerequisite: consent of instructor.*

270. Mechanics of Powder Processing (4)
Powder packing structures. Methods of powder manufacturing, rapid prototyping. Fundamentals of the continuum mechanics of powder deformation, densification in non-uniform temperature fields. Micro-mechanical models of cold powder yielding. Hot consolidation fundamentals, micromechanical models of plastic yielding, power-law creep, diffusion. *Prerequisite: MAE 231A-C, 233B, or consent of instructor.*

271A. Thermodynamics of Solids (4)
(Cross-listed with MATS 201A and ECE 238A.) The thermodynamics and statistical mechanics of solids. Basic concepts, equilibrium properties of alloy systems, thermodynamic information from phase diagrams, surfaces and interfaces, crystalline defects. *Prerequisite: consent of instructor.*

271B. Solid State Diffusion and Reaction Kinetics (4)
(Cross-listed with MATS 201B and ECE 238B.) Thermally activated processes, Boltzmann factor, homogenous and heterogenous reactions, solid state diffusion, Fick's laws, diffusion mechanisms, Kirkendall effect, Boltzmann-Matano analysis, high diffusivity paths. *Prerequisite: consent of instructor.*

271C. Phase Transformations (4)
(Cross-listed with MATS 201C and ECE 238C.) Classification of phase transformations; displacive and reconstructive transformations; classical and non-classical theories of nucleation; Becker-Doering, Volmer-Weber, lattice instabilities, spinodal decomposition. Growth theories; interface migration, stress effects, terrace-ledge mechanisms, epitaxial growth, kinetics and mechanics. Precipitation. Order-disorder transformations. Solidification. Amorphization. *Prerequisites: consent of instructor.*

272. Imperfections in Solids (4)
(Cross-listed with MATS 205A and ECE 234A.) Point, line, and planar defects in crystalline solids, including vacancies, self interstitials, solute atoms, dislocations, stacking faults, and grain boundaries; effects of imperfections on mechanical properties; interactions of dislocations with point defects; strain hardening by micro-obstacles, precipitation, and alloying elements. *Prerequisite: MAE 141A or consent of instructor.*

273A. Dynamic Behavior of Materials (4)
(Cross-listed with MATS 213A.) Elastic waves in continuum; longitudinal and shear waves. Surface waves. Plastic waves; shock waves, Rankine-Hugoniot relations. Method of characteristics, differential and difference form of conservation equations; dynamic plasticity and dynamic fracture. Shock wave reflection and interaction. *Prerequisite: consent of instructor.*

280A. Linear Systems Theory (4)
Linear algebra: inner products, outer products, vector norms, matrix norms, least squares problems, Jordan forms, coordinate transformations, positive definite matrices, etc. Properties of linear dynamic systems described by ODEs: observability, controllability, detectability, stabilizability, trackability, optimality. Control systems design: state estimation, pole assignment, linear quadratic control. *Prerequisite: MAE 141A or 143B, or consent of instructor.*

280B. Linear Control Design (4)
Parametrization of all stabilizing output feedback controllers, covariance controllers, H-infinity controllers, and L-2 to L-infinity controllers. Continuous and discrete-time treatment. Alternating projection algorithms for solving output feedback problems. Model reduction. All control design problems reduced to one critical theorem in linear algebra. *Prerequisite: MAE 280A.*

281A. Nonlinear Systems (4)
Existence and uniqueness of solutions of EDE's, sensitivity equations. Stability, direct and converse Lyapunov theorems, LaSalle's theorem, linearization, invariance theorems. Center manifold theorem. Stability of perturbed systems with vanishing and non-vanishing perturbations, input-to-state ability, comparison method. Input-output stability. Perturbation theory and averaging. Singular perturbations. Circle and Popov criteria. *Prerequisite: MAE 280A.*

281B. Nonlinear Control (4)
Small gain theorem, passivity. Describing functions. Nonlinear controllability, feedback linearization, input-state and input-output linearization, zero dynamics. Stabilization, Brockett's necessary conditions (local), control Lyapunov functions, Sontag's formula (global). Integrator back stepping, forwarding. Inverse optimality, stability margins. Disturbance attenuation, deterministic and stochastic, nonlinear H-infinity. Nonlinear observers. *Prerequisite: MAE 281A.*

282. Adaptive Control (4)
Parametric models. Parameter identtifiers and algorithms, Spr-Lyapunov, gradient, least-squares, persistence of excitation, adaptive observers. Model reference adaptive control, certainity equivalence. Pole placement, polynomial, LQR, indirect. Robustification, parameter drift, leakage, projection, dead zone, dynamic normalization. Adaptive nonlinear control, tuning functions, modular design. Extremum seeking. *Prerequisites: MAE 281A or consent of instructor.*

283A. Parametric Identification: Theory and Methods (4)
Constructing dynamical models from experimental data. Deterministic and stochastic discrete time signals. Discrete time systems. Non-parametric identification: correlation and spectral analysis. Parametric identification: realization and prediction error methods, least squares estimation, approximate modeling. Experiment design. Frequency domain identification. *Prerequisite: MAE 141B or MAE 143C recommended.*

283B. Approximate Identification and Control (4)
Identification for control: approximate identification, estimation of models via closed-loop experiments. Closed-loop identification techniques. Estimation of model uncertainty. Model invalidation techniques. Iterative techniques for model estimation and control design. *Prerequisite: MAE 283A.*

284. Robust and Multi-Variable Control (4)
Multivariable feedback systems: transfer function matrices, Smith-McMillan form, poles, zeros, principal gains, operator norms, limits on performance. Model uncertainties, stability and performance robustness. Design of robust controllers, H_inf and mu synthesis. Controller reduction. *Prerequisite: MAE 141B or MAE 143C, or MAE 280A.*

285. Optimal Control and Estimation (4)
Functional optimization, Bellman's principle of optimality, optimal control and the Pontriagin maximal principle, matrix maximum principle, two-point boundary value problems, Hamilton's principle in dynamics, quadratic costs and linear systems, LQG and optimal estimation, Stochastic processes, case studies. *Prerequisite: MAE 280A*

286. Optimization and Control of Fluid-Mechanical Systems (4)
Model-based control approaches for systems governed by the Navier-Stokes equation are presented. Topics discussed include: transition delay, stabilization of convection, turbulence mitigation and enhancement, noise reduction, weather forecasting, and aerodynamic shape optimization. A general mathematical framework is developed and discussed for robust control in such systems. Techniques for determination of effective control approaches by large-scale simulation are discussed. Gradient-based techniques and reduced-storage inverse-Hessein techniques (BFGS, DFP, SQP) are presented. A class project is required. *Prerequisite: consent of instructor.*

287. Control of Distributed Parameter Systems (4)
Strongly continuous semigroups, infinitesimal generators, unbounded closed linear operators, Hille-Yosida theorem, Riesz-spectral operators. Existence and uniqueness of solutions of abstract evolution equations, pertubation and composite systems. Boundary control systems. Controllability, exact and approximate, Hilbert uniqueness method, fixed point method. Input-output maps, transfer functions. Exponential stability, stabilizability, Lyapunov equation. Controllability via stabiliability. Compensator design. *Prerequisite: MAE 280A or consent of instructor.*

290A. Numerical Methods in Science and Engineering (4)
A general introductory course to numerical methods. Introduction to linear calculus, solution of systems of linear and nonlinear algebraic equations, the algebraic eigenvalue problem, polynomial and trigonometric function interpolation, function differentiation and integration, function approximation. *Prerequisite: MAE 107 or consent of instructor.*

290B. Numerical Methods for Differential Equations (4)
Numerical solution of differential equations in mathematical physics and engineering, ordinary and partial differential equations. Linear and nonlinear hyperbolic parabolic, and elliptic equations, with emphasis on prototypical cases, the convection-diffusion equation, Laplace's and Poisson equation. Finite difference methods will be considered in depth, and additional topics. *Prerequisite: MAE 290A or consent of instructor.*

291. Design and Mechanics in Computer Technology (4)
Design and mechanics problems inherent in computer peripherals such as disk files, tape drives, and printers. Formulation and solution of problems involving mechanics, fluid mechanics, and materials; Reynolds equation, slider bearings; friction and wear; actuator design, impact printing; silicon fluid jets. *Prerequisite: consent of instructor.*

292. Computer-Aided Design and Analysis (4)
Introduction to 2-D and 3-D computer-aided design. Design problems may include: ball bearing kinematics, Weibull statistics, non-repeatable spindle run-out, four bar linkages, beam deflection and vibration, design of magnetic head suspension, hydrodynamic theory of lubrication, air bearings, heat transfer, optical servo, design of ink jet print head. *Prerequisite: consent of instructor.*

293. Advanced Computer Graphics for Engineers and Scientists (4)
Advanced topics used to enhance scientific and engineering visualization. C programming assignments and the use of advanced graphics software. Continuation of topics from MAE 152, including color, computational geometry, 3-D contouring, volume visualization, and hardware architectures. *Prerequisite: MAE 152 or consent of instructor.*

294A. Methods in Applied Mechanics I (4)
Linear algebra and linear spaces. Applications to linear transformations and equations, tensor analysis, linear programming and network analysis. Linear ordinary differential equations and difference equations, integral and discrete transforms, and spectral theory. Applications to linear stability, stochastic processes and numerical methods. *Prerequisite: Math. 110, Math.120A ,or consent of instructor.*

294B. Methods in Applied Mechanics II (4)
Nonlinear ordinary differential and difference equations, applications to dynamical systems, stability, bifurcation and chaos. Regular and singular perturbations, asymptotic expansions and multiscale analyses. Applications to the dynamics of mechanical, chemical and biological systems. *Prerequisite: MAE 294A or consent of instructor.*

294C. Methods in Applied Mechanics III (4)
Partial differential equations and boundary-value problems, classification of PDE's and transform methods. Green's functions and spectral theory. Non- linear PDE's, variational methods and the methods of characteristics. Non- linear waves and shocks. Asymptotic methods: WKB and stationary phase. Galerkin methods and numerical analysis of PDE's. Applications to continuum mechanics and transport phenomena. *Prerequisite: MAE 294B or consent of instructor.*

296. Independent Study (4)
Independent reading or research on a problem as arranged by a designated faculty member. Must be taken for a letter grade only. *Prerequisite: consent of instructor.*

298. Directed Group Study (1-4)
Directed group study on a topic or in a field not included in regular department curriculum, by special arrangement with a faculty member. *Prerequisite: consent of instructor.* (S/U grades permitted.)

299. Graduate Research (1-12)
(S/U grades only.)

501. Teaching Experience (2)
Teaching experience in an appropriate MAE undergraduate course under direction of the faculty member in charge of the course. Lecturing one hour per week in either a problem-solving section or regular lecture. (S/U grade only.) *Prerequisites: consent of instructor and the MAE department.*

Structural Engineering (SE)

STUDENT AFFAIRS: 349 Science and Engineering Research Facility (SERF), University Center
http://www.structures.ucsd.edu

Professors

R.J. Asaro, Ph.D.
A.W. Elgamal, Ph.D., *Chair*
G.A. Hegemier, Ph.D.
V. Karbhari, Ph.D.
J.B. Kosmatka, Ph.D.
J.E. Luco, Ph.D.
M.J.N. Priestley, Ph.D., *Emeritus*
F. Seible, Ph.D., P.E., *Dean, Jacobs School of Engineering*
C.M. Uang, Ph.D., *Vice Chair*

Associate Professors

S.A. Ashford, Ph.D., P.E.
J.P. Conte, Ph.D., *Vice Chair*
F. Lanza di Scalea, Ph.D.
J. Restrepo, Ph.D.

Assistant Professors

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Affiliated Faculty

R. Dowell, Ph.D., *Assistant Adjunt Professor*
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Professional Research Staff

G. Benzoni, Ph.D., *Associate Research Scientist*
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Structural Engineering is the branch of engineering concerned with the design and analysis of civil, mechanical, aerospace, marine, naval and offshore structures. It requires knowledge and competence in the areas of materials, response of individual structural components and the behavior of entire structural systems.

Department Focus

The instructional and research programs of the department are grouped into four programmatic focus areas: civil structures, aerospace and composite structures, renewal of structures, and earthquake engineering. Both the undergraduate and graduate programs are characterized by strong interdisciplinary relationships with the Departments of Mechanical and Aerospace Engineering, Physics, Mathematics, Bioengineering, Chemistry, Electrical and Computer Engineering, Computer Science and Engineering, the Materials Science Program, and associated campus institutes such as the Institute of Geophysics and Planetary Physics, Institute for Pure and Applied Physical Sciences, Institute for Biomedical Engineering, Center of Excellence for Advanced Materials, California Space Institute, Cal(IT)^2, and Scripps Institution of Oceanography.

The programs and curricula of the Department of Structural Engineering will educate and train engineers in a holistic approach to structural systems engineering by emphasizing and building on the commonality of engineering structures in materials, mechanics, analysis and design across the engineering disciplines of civil, aerospace, marine and mechanical engineering.

Although structural engineering is traditionally viewed as an activity within civil engineering, in actuality many other engineering disciplines such as aerospace, marine (naval, offshore), and mechanical engineering contain well established discipline-specific structural systems and components. In all of the various engineering disciplines there exists a large commonality in the structural materials used, in the general principles of structural mechanics, in the overall design philosophy and criteria, and in the modeling and analysis tools employed for the numerical quantification and visualization of structural response. Particularly, small disciplinary differences in materials and computational tools are rapidly disappearing with the civil engineering community opening up to new structural materials developed and used to date primarily in the aerospace industry, and with computational developments which are less product specific but more geared towards a holistic structural systems design approach with interactive graphics, object-oriented database management and concurrent visualization and data processing. Developments in overall structural systems design are increasingly cross-disciplinary over many traditional engineering areas.

The Undergraduate Program

Degree and Program Options

The Department of Structural Engineering offers an unique engineering program leading to the B.S. degree in structural engineering which is accredited by the Engineering Accreditation Commission of the Accreditation Board for Engineering and Technology (EAC/ABET). The Department of Structural Engineering also offers a nonaccredited B.S. degree in engineering sciences. The B.S. programs require a minimum of 148 units, plus college requirements in humanities and social sciences.

All Structural Engineering programs of study have strong components in laboratory experimentation, numerical computation, and engineering design. Design is emphasized throughout the curricula by open-ended homework problems, by laboratory and computer courses which include student-initiated projects, and finally, by senior design project courses which involve teams of students working to solve engineering design problems brought in from industry. The Structural Engineering programs are designed to prepare students receiving bachelor's degrees for professional careers or for graduate education in their area of specialization. In addition, the programs can also be taken by students who intend to use their undergraduate engineering education as preparation for postgraduate professional training in non-technical fields such as business administration, law or medicine.

Structural Engineering is concerned with the design and analysis of civil, mechanical, aerospace, marine, naval, and offshore structures. Examples include bridges, dams, buildings, aircraft, spacecraft, ships, oil platforms, automobiles, and other transportation vehicles. This field requires a thorough knowledge of the behavior of solids (concrete, soils, rock, metals, plastics, and composite materials), fluid mechanics as it relates to structural loads, dynamics as it relates to structural response, mathematics for the generation of theoretical structural models and numerical analysis, and computer science for simulation purposes associated with computer-aided design, response analyses, and data acquisition. Basic understanding of materials behavior

and structural performance is enhanced by laboratory courses involving static and dynamic stress failure tests of structural models, and response of structural systems. Within this area, students can specialize in (a) civil structures, (b) aerospace structures, (c) renewal of structures, or (d) earthquake engineering.

The **engineering sciences** program follows the overall Structural Engineering program except that the number of required design courses are reduced. In addition to core courses in dynamics, vibrations, structures, fluid mechanics, thermodynamics, heat transfer, and laboratory experimentation, a large number of technical electives are scheduled. This aspect of the curriculum allows flexibility by permitting specialization and in-depth study in one area of the engineering sciences or through a sequence of courses on various emerging technologies. Students must consult their advisers to develop a sound course of study to fulfill the technical elective requirements of this program.

Major Requirements

Specific course requirements for the major are outlined in a table herein. In addition to the required technical courses specifically indicated, a suggested scheduling of humanities and social science courses (HSS) are distributed in the curricula for students to use to meet college general-education requirements. To graduate, students must maintain an overall GPA of at least 2.0, and the department requires at least a C– grade in each course required for the major.

Deviations from the program of study must be approved by the Undergraduate Affairs Committee prior to taking alternative courses. In cases where a student needs to take a course outside UCSD, prior departmental approval is essential. In addition, technical elective (TE) course selections must have departmental approval prior to taking the courses. In the accredited program, TE courses are restricted to meet ABET standards. Courses such as SE 195, SE 197 and SE 198 are not allowed as technical electives in meeting the upper-division major requirements. SE 199 can be used as a technical elective only under restrictive conditions. Policies regarding these conditions may be obtained from the department's Student Affairs Office. Graduate level courses may be petitioned for technical elective credit.

Students with different academic preparations may vary the scheduling of lower-division courses such as math, physics and chemistry, but should consult the department prior to doing so. Deviations in scheduling lower-division Structural Engineering courses are discouraged due to scheduling constraints. A tentative schedule of course offerings is available from the department each spring quarter for the following academic year.

General-Education/College Requirement

For graduation, each student must satisfy general-education course requirements determined by the student's college, as well as the major requirements determined by the department. The six colleges at UCSD require widely different general-education courses, and the number of such courses differs from one college to another. Each student should choose his or her college carefully, considering the special nature of the college and the breadth of general education.

The Structural Engineering program allows for twelve humanities and social science (HSS) courses so that students can fulfill their college requirements. In the ABET accredited programs, students must develop a program that includes a total of at least twenty-four units in the arts, humanities, and social sciences, not including subjects such as accounting, industrial management, finance, or personnel administration. It should be noted, however, that some colleges may require more than twelve HSS courses indicated in the curriculum tables. Accordingly, students in these colleges may take longer to graduate than the indicated four-year schedule. Students must consult with their college to determine which HSS courses to take.

Professional Licensing

All students are encouraged to take the Engineering-in-Training (EIT) examination as the first step in becoming licensed as a professional engineer (PE). Students graduating from an accredited program can take the PE examination after EIT certification and two years of work experience; students graduating from a nonaccredited program can take the PE examination after EIT certification and four years of work experience.

For further information please contact the Student Affairs Office or your local Board of Registration for Professional Engineers and Land Surveyors.

STRUCTURAL ENGINEERING (ABET Accredited Program)

Mission Statement

To provide a comprehensive education and training to engineers using a holistic approach to structural systems engineering by emphasizing and building on the commonality of engineering structures at the levels of materials, mechanics, analysis, and design.

GOALS

1. To provide our students with a strong technical education that will prepare students receiving Bachelor's degrees for professional careers in industry, or for continued graduate education in their area of specialization.
2. To provide our students with cross-disciplinary technical education to adequately prepare them for a rapidly changing technological world based on the commonality of knowledge across structural engineering disciplines thereby ensuring that they are able to continuously meet professional objectives throughout their careers.
3. To provide our students with a firm foundation for professional advancement not just through technical expertise, but also through communication skills, team and group activities, and ethical/professional responsibility as designers and engineers.

OBJECTIVES

- To provide a sound basis in the general sciences and mathematics that underlie the cross-disciplinary field of structural engineering.
- To provide a thorough training in the design principles and structural action as related to components and systems over a broad range of application areas.
- To provide a thorough training in the methods of analysis, including problem formulation and the use of current mathematical and computational tools.
- To provide an understanding of structural action at the component and systems level through design, analysis, and experimentation.
- To provide through structure and flexibility in the curriculum the opportunity for students to have both specialization (through focus sequences) and breadth (through technical electives) in the area of structural engineering.

- To instill in students the ability of critical and innovative thinking, and ability to formulate solutions based on sound principles of structural mechanics and materials.
- To teach students techniques of experimentation and data analysis, including the use of statistics and reliability methods required for structural applications.
- To teach the fundamentals of the design process initiating in conceptual design and culminating in final design including the use of appropriate codes of practice.
- To prepare students in the skills needs for successful professional practice as related to team participation, and effective verbal and written communication.
- To instill in our students an understanding and acceptance of their professional and ethical responsibilities.

FALL	WINTER	SPRING
FRESHMAN YEAR		
Math. 20A	Math. 20B	Math. 20C
SE 1	MAE 9	SE 2
Chem. 6A	Phys. 2A	Phys. 2B/2BL
HSS[1]	HSS	HSS
SOPHOMORE YEAR		
Math. 20D	Math. 20F	Math. 20E
Phys. 2C/2CL	SE 102	SE 103
SE 101A	SE 101B	SE 110A
HSS	HSS	HSS
JUNIOR YEAR		
SE 121	SE 120	MAE 170
SE 125	MAE 101A	TE[2]
SE 110B	SE 130A	SE 130B
HSS	HSS	HSS
SENIOR YEAR		
SE 101C	SE 131	SE 140
TE	TE	FS
FS[3]	FS	FS
HSS	HSS	HSS

[1] In fulfilling the humanities and social science requirements (HSS), students must take a total of at least twenty-four units in the arts, humanities, and social sciences, not including subjects such as accounting, industrial management, finance, or personnel administration. Twelve HSS courses are listed here; individual college requirements may be higher.

[2] Technical elective (TE) course must be an upper-division or graduate course in the engineering sciences, natural sciences or mathematics, selected with prior approval of the department to meet ABET standards.

[3] Students must take one full focus sequence (FS) in either (a) Civil Structures (SE 150, SE 151A, SE 151B, SE 181), or (b) Aerospace Structures (SE 160A, SE 160B, SE 142, SE 163), or (c) Renewal of Structures (SE 170, SE 171, SE 142, SE 163), or (d) Earthquake Engineering (SE 180, SE 181, SE 182, SE 152). Students should note that not all focus sequence classes will be offered every year.

ENGINEERING SCIENCES
(Non-Accredited Program)

FALL	WINTER	SPRING
FRESHMAN YEAR		
Math. 20A	Math. 20B	Math. 20C
SE 1	MAE 9	SE 2
Chem. 6A	Phys. 2A	Phys. 2B/2BL
HSS[1]	HSS	HSS
SOPHOMORE YEAR		
Math. 20D	Math. 20F	Math. 20E
Phys. 2C/2CL	SE 102	SE 103
SE 101A	SE 101B	SE 110A
HSS	HSS	HSS
JUNIOR YEAR		
SE 121	SE 120	MAE 170
SE 125	MAE 101A	TE[2]
SE 110B	SE 130A	SE 130B
HSS	HSS	HSS
SENIOR YEAR		
SE 101C	SE 131	SE 140
TE	TE	TE
TE	TE	TE
HSS	HSS	HSS

[1] In fulfilling the humanities and social science requirements (HSS), students must take a total of at least twenty-four units in the arts, humanities, and social sciences, not including subjects such as accounting, industrial management, finance, or personnel administration. Ten HSS courses are listed here; individual college requirements may be higher.

[2] Technical elective (TE) course must be an upper-division or graduate course in the engineering sciences, natural sciences or mathematics, selected with prior approval of the department to meet ABET standards.

Policies and Procedures for Structural Engineering Undergraduate Students

Admission to the Major

Admission to the department as a Structural Engineering major, or to fulfill a major in another department which requires Structural Engineering courses, is in accordance with the general requirements established by the School of Engineering. The admission requirements and procedures are described in detail in the section on "Admiss-ion to the School of Engineering" in this catalog. All students are expected to complete lower- and upper-division courses, as suggested in the curriculum tables, in a timely fashion in the sequences outlined.

Transfer Students

Requirements for admission as a Structural Engineering major, or into Structural Engineering courses, are the same for transfer students as they are for continuing students (see section on "Admission to the School of Engineering" in this general catalog). Accordingly, when planning their program, transfer students should be mindful of lower-division prerequisite course requirements, as well as for meeting collegiate requirements.

Students who have taken equivalent courses elsewhere may request to have transfer credits apply toward the department's major requirements. This is accomplished by submitting a petition for transfer credits together with a transcript and catalog course description from the institution where the course(s) were taken. These documents are reviewed for approval by the Structural Engineering Undergraduate Affairs Committee.

Effective **fall 2004**, it is **strongly recommended** that transfer students complete the following preparation for engineering majors*:

- Calculus I—for Science and Engineering (Math. 20A)
- Calculus II—for Science and Engineering (Math. 20B)
- Calculus and Analytic Geometry (Math. 20C)
- Differential Equations (Math. 20D)
- Linear Algebra (Math. 20F)
- Complete calculus-based physics series with lab experience (Physics 2A-B-C)
- Chemistry 6A (except Computer Science and Computer Engineering majors)
- Highest level of introductory computer programming language course offerings at the community college**

*Effective **fall 2006**, these courses will be **required** preparation for all engineering transfer students.

**Refer to the *UCSD General Catalog* to select major prerequisite requirement for computer language courses.

No transfer credit will be given for courses similar to SE 1 and SE 2. SE 1 and SE 2 must be taken by all students majoring in Structural Engineering.

Transfer petitions are available from the Structural Engineering Student Affairs Office.

Academic Advising

Upon arrival, students must make an appointment with the undergraduate adviser in the Structural Engineering Student Affairs Office to plan a program of study. The program plan may be revised in subsequent years, but revisions

involving curricular requirements require approval by the undergraduate adviser or the Undergraduate Affairs Committee. Because some courses and/or curricular changes may be made every year, it is imperative that students consult with the department's undergraduate adviser and their assigned faculty adviser on an annual basis.

Many Structural Engineering courses are offered only once a year and therefore should be taken in the recommended sequence. If courses are taken out of sequence, it may not always be possible to enroll in subsequent courses as desired or needed. If this occurs, students should seek immediate department advice. When a student deviates from the sequence of courses specified for the curriculum in this catalog, it may be impossible to complete the Structural Engineering major within the normal four-year period. Structural Engineering advisers will be monitoring the progress of students in order for them to remain on track.

In addition to the advise available through the Structural Engineering Student Affairs Office, programmatic or technical advice may be obtained from Structural Engineering faculty members. A specific Structural Engineering faculty adviser is assigned to each Structural Engineering student. All Structural Engineering students are required to meet with their faculty adviser at least once a year, preferably before the beginning of fall quarter.

Program Alterations/Exceptions to Requirements

Variations from, or exceptions to, any program or course requirements are possible only if a petition is approved by the Structural Engineering Undergraduate Affairs Committee before the courses in question are taken. Petition forms may be obtained from the Structural Engineering Student Affairs Office and must be processed through this office.

Independent Study

Structural Engineering students may take SE 199, Independent Study for Undergraduates, under the guidance of a Structural Engineering faculty member. Normally, this course is taken as an elective on a P/NP basis. Under very restrictive conditions, however, it may be used to satisfy upper-division technical elective course requirements for the major. Students interested in this alternative must identify a faculty member with whom they wish to work and propose a two-quarter research or study topic. After obtaining the faculty member's concurrence on the topic and scope of the study, the student must submit a Special Studies Course form (each quarter) and the "SE 199 as Technical Elective Contract" form to the Structural Engineering Undergraduate Affairs Committee. These forms must be completed, approved, and processed **prior** to the beginning of the quarter in which the course is to be taken. This should not be done during the add/drop period. Detailed policy in this regard and the requisite forms may be obtained from the Student Affairs Office.

Teaching

Students interested in participating in the instructional activities of the department may take SE 195, Undergraduate Teaching. Policy in this regard and the appropriate forms may be obtained from the Structural Engineering Student Affairs Office.

Bachelor's/Master's Program

The department offers a bachelor's/master's degree program to enable students to complete both the B.S. and M.S. degrees in an accelerated timeframe. Undergraduate students in the Department of Structural Engineering who have at least 148 quarter units with a cumulative 3.5 M.W. GPA are eligible to apply. Admission to the bachelor's/master's degree program is not automatic. Student applications are reviewed and the final decision is made by the Department of Structural Engineering. Acceptance into this program is an honor which carries with it practical benefits—the graduate application process is simplified (no GREs required) and advanced students are given access to graduate level courses. Upon acceptance as an undergraduate into the program, a faculty member will be assigned who will serve as the student's adviser. Interested students should contact the Structural Engineering Student Affairs Office. Students must fulfill all requirements for the B.S. degree prior to being formally admitted to graduate status.

The Graduate Program

The Department of Structural Engineering offers instruction leading to the degrees of Master of Science (M.S.) and Doctor of Philosophy (Ph.D.) in Structural Engineering (SE). The graduate program is aimed at training a select number of highly skilled professionals in structural engineering with the academic and engineering credentials to assume leadership roles in industry and academia.

The M.S. degree program is intended to provide students with additional fundamental knowledge as well as specialized advanced knowledge in selected structural engineering aspects over and above the undergraduate degree course work.

The Doctor of Philosophy (Ph.D.) degree program is intended to prepare students for careers in teaching, research, and/or in their chosen professional specialties. The Ph.D. program requires a departmental comprehensive examination, a Ph.D. candidacy examination, a Ph.D. dissertation based on new and unique research, and a dissertation defense.

Both degrees offer opportunities for training in one or more of the four primary research thrusts within the SE department which are in (1) Earthquake Engineering, (2) Advanced Composites and Aerospace Structural Systems, (3) Renewal Engineering, and (4) Damage Prognosis and Validated Simulations.

Admission to the UCSD graduate division requires at least a B.S. degree in engineering, physical sciences, or mathematics with an overall upper-division GPA of 3.0. Applicants must provide three letters of recommendation and recent GRE general test scores. A minimum TOEFL score of 550 (213 computer-based) is required from international applicants whose native language is not English. Based on the candidate's background, qualifications, and career objectives, admission to the program is in one of two categories: M.S. or Ph.D.

Applicants seeking enrollment in SE courses via UC Extension's concurrent registration program are advised to refer to the ***Graduate Studies Transferring Credit*** section of the *UCSD General Catalog* for clarification.

Master's Degree Program

The M.S. degree program is intended to provide the student with additional fundamental knowledge as well as specialized advanced knowledge in selected structural engineering aspects over and above the undergraduate degree course work. Two plans, the M.S. Thesis Plan and the M.S. Comprehensive Examination Plan, are offered. The M.S. Thesis Plan is designed

for those students with an interest in research prior to entering the structural engineering profession or prior to entering a doctoral degree program. The M.S. Thesis Plan involves course work and research culminating with the preparation and defense of a master's thesis. The M.S. Comprehensive Examination Plan involves course work and culminates with a public oral presentation related to the courses the student has taken. The topic is selected by the student's adviser. This presentation is evaluated by a committee of three faculty and must take place in the final quarter of courses.

M.S. students must complete forty-eight units of credit for graduation. For the M.S. Comprehensive Examination Plan all forty-eight units of credit must consist of regular courses (twelve courses). For the M.S. Thesis Plan, thirty-six units (nine courses) from regular courses are required, in addition to twelve units of graduate research for the master's thesis. For both M.S. plans, students are required to complete a minimum of two sequences from the following focus areas:

1. Structural Analysis
2. Structural Design
3. Earthquake Engineering
4. Advanced Composites
5. Solid Mechanics
6. Advanced Structural Behavior

A sequence is composed of three regular courses from the same focus area. The courses comprising the focus sequences are listed in the table in this section. To meet the specific needs of some students, other focus areas may be developed by a student in consultation with his or her adviser, but these must be approved by the SE Graduate Affairs Committee. To allow for greater flexibility in the program, the remaining credits required from courses may be earned by completing additional focus sequences, parts of focus sequences, graduate seminars, or other appropriate courses. Students may elect to take other appropriate technical electives (with the approval of their adviser and the SE Graduate Affairs Committee). Up to twelve units of upper-division undergraduate (100-level) courses will be allowed in the M.S. program.

The department also offers two seminar courses each quarter dealing with current research topics in Earthquake Engineering (SE 290) and Advanced Composites (SE 291). All master's students are required to take one of these two seminar courses each quarter they are registered.

Focus Sequences

FOCUS SEQUENCE	COURSES
Structural Analysis	Advanced Structural Analysis Structural Stability Dynamics of Structure
Structural Design	Advanced RC/PC Design Advanced Structural Steel Design Bridge Design
Earthquake Engineering	Structural Dynamics Earthquake Engineering Geotechnical Earthquake Engineering Advanced Seismic Design of Structures
Advanced Composites	Design of Composite Structures Processing Science of Composites Experimental Mechanics and NDE Mechanics of Laminated Composite Structures
Solid Mechanics	Solid Mechanics for Structural and Aerospace Engineering Theory of Elasticity Theory of Plasticity and Viscoelasticity Experimental Mechanics and Nondestructive Evaluation
Advanced Structural Behavior	Nonlinear Mechanical Vibrations Structural Reliability and Risk Analysis Random Vibrations Experimental Mechanics and Nondestructive Evaluation

The thesis defense is the final examination for students enrolled in the M.S. thesis plan and must be conducted after completion of all course work. Upon completion of the research project, the student writes a thesis that must be successfully defended in an oral examination and public presentation conducted by a committee composed of three faculty. A complete copy of the student's thesis must be submitted to each member of the M.S. thesis committee (comprised of a minimum of three faculty) at least two weeks before the defense.

Doctoral Degree Program

The Ph.D. program is intended to prepare students for a variety of careers in research, teaching and advanced professional practice in the broad sense of structural engineering, encompassing civil and aerospace structures, earthquake and geotechnical engineering, composites, and engineering mechanics. Depending on the student's background and ability, research is initiated as soon as possible. All students, in consultation with their advisers, develop course programs that will prepare them for the Departmental Comprehensive Examination and for their dissertation research. However, these programs of study and research must be planned to meet the time limits established to advance to candidacy and to complete the requirements for the degree. Doctoral students who have passed the Departmental Comprehensive Examination may take any course for an S/U grade, with the exception of any course that the student's Departmental Comprehensive or Ph.D. Candidacy Examination Committee stipulates must be taken in order to remove a deficiency. It is strongly recommended that all Structural Engineering graduate students take a minimum of two courses (other than research) per academic year after passing the Departmental Comprehensive Examination.

The department also offers two seminar courses each quarter dealing with current research topics in Earthquake Engineering (SE 290) and in Advanced Composite Materials (SE 291). All Ph.D. students are required to take one of these two seminar courses each quarter they are registered.

Doctoral Examinations: A Structural Engineering Ph.D. student is required to pass three examinations. The first is a **Departmental Comprehensive Examination** which should be taken within three to six quarters of full-time graduate study and requires a 3.5 GPA. This examination is intended to determine the student's ability to successfully pursue a research project at a level appropriate for the doctoral degree. It is administered by at least four faculty, three of whom must be in Structural Engineering. The student is responsible for material pertaining to four focus areas. In order to insure appropriate breadth, the focus areas should consist of the following: (a) two focus areas within Structural Engineering which are closely related to the student's research interests, (b) one focus area within Structural Engineering that is not directly related to the student's area of research, and (c) one minor focus area outside the Department of Structural Engineering. Minor areas too closely related to the major areas will not be approved by the SE Graduate Affairs Committee. The Solid Mechanics Focus Sequence, which is jointly taught by Structural Engineering and the Department of Mechanical and Aerospace Engineering,

cannot be used to satisfy the outside Structural Engineering requirement. Students intending to specialize in the emerging areas of structural health monitoring, damage prognosis, and validated simulations are advised to take courses in the focus areas of Advanced Structural Behavior and elective courses MAE 283, MAE 261, ECE 251AN, ECE 254, and CSE 291 which can be used to satisfy the outside Structural Engineering requirement. In addition, the department has opportunities for select students in these areas to participate in special seminars, reviews, and research at leading collaborating institutes and laboratories such as the Los Alamos National Laboratories.

Since the examination areas must be approved by the SE Graduate Affairs Committee, students are advised to seek such approval well before their expected examination date, preferably while planning their graduate studies. Although students are not required to take particular courses in preparation for the departmental comprehensive examination, the scope of the examination in each area is associated with a set of three graduate courses, generally focus sequences offered or approved by the department. A candidate can develop a sense of the level of knowledge expected to be demonstrated during the examination by studying the appropriate syllabi and/or discussing the course content with faculty experienced in teaching the courses involved. The Departmental Comprehensive Examination may be a written or an oral examination, at the discretion of the committee.

Teaching experience is required of all Structural Engineering Ph.D. students prior to taking the Ph.D. Candidacy Examination. Teaching experience is defined as lecturing one hour per week in either a problem-solving section or laboratory session, for one quarter in an undergraduate course designated by the department. The requirement can be fulfilled by service as a teaching assistant or taken as a course for academic credit. Students must contact the Student Affairs Office to plan for completion of this requirement.

The **Ph.D. Candidacy Examination** is the second examination required of Structural Engineering doctoral students. In preparation for the Ph.D. Candidacy Examination, students must have completed the Departmental Comprehensive Examination and the Departmental Teaching Experience requirement, obtained a faculty research adviser, have identified a topic for their dissertation research, and have made initial progress in that research. At the time of application for advancement to candidacy, a doctoral committee responsible for the remainder of the student's graduate program is appointed by the Graduate Council. In accordance with Academic Senate Regulations 715(D): "A doctoral committee of five or more members shall be appointed by the dean of Graduate Studies under the authority of the Graduate Council. The committee members shall be chosen from at least two departments, and at least two members shall represent academic specialties that differ from the student's chosen specialty. In all cases, each committee must include one tenured UCSD faculty member from outside the student's major department." The committee conducts the Ph.D. Candidacy Examination, during which students must demonstrate the ability to engage in dissertation research. This involves the presentation of a plan for the dissertation research project. A short written document describing the research plan must be submitted to each member of the committee at least two weeks before the Ph.D. Candidacy Examination. The committee may ask questions directly or indirectly related to the research project and general questions that it determines to be relevant. Upon successful completion of this examination, students are advanced to candidacy and are awarded the Candidate in Philosophy degree. The Ph.D. Candidacy Examination is an oral examination.

The Dissertation Defense is the final Ph.D. examination. Upon completion of the dissertation research project, the student writes a dissertation that must then be successfully defended in an oral examination and public presentation conducted by the doctoral committee. A complete copy of the student's dissertation must be submitted to each member of the doctoral committee at least four weeks before the defense. While the copy of the dissertation handed to the committee is expected to be complete and in final form, it should be noted that students are expected to make changes in the text per direction of the committee as a result of the defense. This examination cannot be conducted earlier than three quarters after the date of advancement to doctoral candidacy. Acceptance of the dissertation by the Office of Graduate Studies and Research and the university librarian represents the final step in completion of all requirements for the Ph.D.

Ph.D. Time Limit Policy. Pre-candidacy status is limited to four years. Doctoral students are eligible for university support for six years. The defense and submission of the doctoral dissertation must be within seven years.

Evaluations. In the spring of each year, the faculty evaluate each doctoral student's overall performance in course work, research, and prospects for financial support for future years. A written assessment is given to the student after the evaluation. If a student's work is found to be inadequate, the faculty may determine that the student cannot continue in the graduate program.

COURSES

All students enrolled in Structural Engineering courses or admitted into a Structural Engineering program are expected to meet prerequisite and performance standards, i.e., students may not enroll in any SE courses or courses in another department which are required for the major prior to having satisfied prerequisite courses with a C- or better. (The department does not consider D or F grades as adequate preparation for subsequent material.) Additional details are given under the various program outlines, course descriptions, and admission procedures for the School of Engineering in this catalog. Furthermore, the majority of SE courses have enrollment restrictions which give priority to, or are open only to, declared pre-engineering students and/or to students who have been admitted to an engineering major. Where these restrictions apply, the registrar will not enroll other students except by department stamp on class enrollment cards. The department expects that students will adhere to these policies on their own volition and enroll in courses accordingly. Students are advised that they may be dropped at any time from course rosters if prerequisites and/or performance standards have not been met.

While some lower-division courses may be offered more than once each year, most SE upper-division courses are taught only once per year, and courses are scheduled to be consistent with the curricula as shown in the tables. When possible, SE does offer selected large enrollment courses more than once each year. A tentative schedule of course offerings is available from the department each spring for the following academic year.

LOWER-DIVISION

SE 1. Introduction to Structures and Design (4) Introduction to structural components, systems from aerospace, civil, mechanical, marine and offshore areas. Structural action, the design process. History of structural engineering. Role and responsibility of

structural engineers in society. Engineering economics, costs-benefits analysis. Implications on safety. Professional ethics. *Prerequisite: priority enrollment given to structural engineering majors.*

SE 2. Structural Materials (4)
Structure of engineering materials (metals, ceramics, concrete, composites) tailoring to produce desired properties and response in structural components and systems. Mechanical tests, elasticity, plastic deformation, fracture, toughness, creep and fatigue. Selection based on performance requirements/application. Laboratory demonstrations and tests. *Prerequisites: Chem. 6A, Phys. 2A. Priority enrollment given to structural engineering majors and mechanical and aerospace engineering majors.*

SE 87. Freshman Seminar (1)
The freshman seminar program is designed to provide new students with the opportunity to explore an intellectual topic with a faculty member in a small seminar setting. Freshman seminars are offered in all campus departments and undergraduate colleges, and topics vary from quarter to quarter. *Prerequisite: open to freshmen only.*

UPPER-DIVISION

SE 101A. Mechanics I: Statics (4)
Principles of statics using vectors. Two- and three-dimensional equilibrium of statically determinate structures under discrete and distributed loading including hydrostatics; internal forces and concept of stress; free body diagrams; moment, product of inertia; analysis of trusses and beams. *Prerequisites: grades of C- or better in Math. 20C and Phys. 2A.*

SE 101B. Mechanics II: Dynamics (4)
Kinematics and kinetics of particles in two- and three-dimensional motion using vector representation. Orbital mechanics. Work, energy, and power. Conservative forces, conservation principles. Momentum, impulsive motion, and impact. Rigid body kinetics and kinematics; Coriolis acceleration, Eulerian angles. Undamped vibrating systems. *Prerequisites: grades of C- or better in Math. 21D, and SE 101A, or MAE 130A.*

SE 101C. Structural Mechanics III: Structural Dynamics (4)
Free and forced vibrations of damped 1-DOF systems; vibrations isolation, impact and packaging problems. Analysis of discrete MDOF systems using matrix representation; normal mode of frequencies and modal matrix formulation. Lagrange's equations. Modal superposition for analysis of continuous vibrating systems. *Prerequisites: grade of C- or better in SE 101B (or MAE 130B) and SE 130B; SE major.*

SE 102. Numerical, Computational, and Graphical Tools (4)
Introduction to engineering graphics and computer-aided design (CAD). Introduction to numerical computer algorithms and symbolic computation. Introduction to the development of methods for assessing the accuracy of numerical methods. *Prerequisites: grade of C- or better in MAE 9 and SE 101A or MAE 130A; SE major.*

SE 103. Conceptual Structural Design (4)
Introduction to design principles and structural action. Development of design theories, approaches and methodology. Concepts of load and resistance factors, factors of safety, limit and ultimate states, design allowables. Simple design examples from aerospace, civil, marine, offshore and mechanical structural systems. *Prerequisites: grade of C- or better in SE 2, SE 101A.* Priority enrollment given to structural engineering majors.

SE 110A. Solid Mechanics I (4)
Mechanics of deformable bodies under axial, torsional, shearing, and bending loads. Elastic and plastic uniaxial material response as well as 3-D Hooke's law. Mohr's circle for stress and strain. Problems of design for rods, shafts, beams, columns, pressure vessels, and thin walled members. *Prerequisites: grades of C- or better in Math. 20D, 20F, SE 101A.* Priority enrollment given to structural engineering majors.

SE 110B. Solid Mechanics II (4)
Advanced concepts in the mechanics of deformable bodies. Unsymmetrical bending of symmetrical and unsymmetrical sections. Bending of curved beams. Shear center and torsional analysis of open and closed sections. Stability analysis of columns, lateral buckling. Application of the theory of elasticity in rectangular coordinates. *Prerequisite: grade of C- or better in SE 110A.* Priority enrollment given to structural engineering majors.

SE 120. Engineering Graphics & Computer Aided Structural Design (4)
Engineering graphics, solid modeling, CAD applications including 2-D and 3-D transformations, 3-D viewing, wire frame and solid models, Hidden surface elimination. *Prerequisite: grade of C- or better in MAE 9.* Priority enrollment given to structural engineering majors.

SE 121. Numerical Methods in Engineering (4)
Advanced numerical methods for applications for engineering problems. Solution of systems of linear and nonlinear equations, function interpolation and curve fitting, function approximation, computation of integrals, numerical differentiation, and solution of systems of ordinary differential equations. *Prerequisites: grade of C- or better in SE 102, and Math. 20F; SE major.*

SE 125. Statistics, Probability and Reliability (4)
Probability theory. Statistics, data analysis and inferential statistics, distributions, confidence intervals. Introduction to structural reliability and random phenomena. Applications to components and systems. *Priority enrollment given to structural engineering majors.*

SE 130A-B. Structural Analysis (4)
Classical methods of analysis for statically indeterminate structures. Development of computer codes for the analysis of civil, mechanical, and aerospace structures from the matrix formulation of the classical structural theory, through the direct stiffness formulation, to production-type structural analysis programs. *Prerequisites: grades of C- or better in SE 110 A, SE 121, and SE 130A for SE 130B.* Priority enrollment given to structural engineering majors.

SE 131. Finite Element Analysis (4)
Development of stiffness and mass matrices based upon virtual work and variational principles. Application to static and dynamic problems in structural and solid mechanics. The use of general purpose finite element structural analysis codes. *Prerequisites: grade of C- or better in SE 103, SE 130B, MAE 170, and senior standing in the major.*

SE 140. Structures and Materials Laboratory (4)
Introduction to instrumentation and testing techniques. Discussion of standard tension and compression tests. Similitude relationships for structural models. Term project in model structure including complete engineering report on theory, design and results of the term project. *Prerequisites: grade of C- or better in SE 103, SE 130B, MAE 170, and senior standing in the major.*

SE 142. Design of Composite Structures (4)
Design and analysis of lightweight structures composed of laminated composite materials. Stiffness, strength, failure mechanisms, micromechanics, and hygrothermal behavior. Fabrication and experimental testing. Design projects that involve computer implementation. *Prerequisites: grade of C- or better in SE 110A-B; priority given to engineering majors.*

SE 144. Aerospace Structural Analysis (4)
Aspects of structural analysis pertinent to the design of flight vehicles; aerodynamic/inertial loadings, aerospace laminated materials, elements of plate theory, aeroelastic divergence, introduction of matrix methods for structural dynamics and buckling. *Prerequisites: grades of C- or better in SE 101C, SE 110A-B.* Priority enrollment given to structural engineering majors and mechanical and aerospace engineering majors.

SE 150. Design of Steel Structures (4)
Design concepts and loadings for structural systems. Working stress and ultimate strength design theories. Properties of structural steel. Elastic design of tension members, beams, and columns. Design of bolted and welded concentric and eccentric connections. Design of composite floors. Introduction to plastic design. *Prerequisites: grade of C- or better in SE 103, and SE 130A.* Priority enrollment given to structural engineering majors.

SE 151A-B. Design of Structural Concrete (4-4)
Concrete and reinforcement properties. Service and ultimate limit state analysis and design. Design and detailing of structural components. Concept of prestressing. Design and application of prestressed structures and components. *Prerequisites: grade of C- or better in SE 103, SE 130A and SE 130B. SE 151A for SE 151B; SE major.*

SE 152. Seismic Design of Structures (4)
Seismic design philosophy. Ductility concepts. Lateral force resisting systems. Mechanisms of nonlinear deformation. Methods of analysis. Detailing of structural steel and reinforced concrete elements. Lessons learned from past earthquakes. Multistory building design project. *Prerequisites: grade of C- or better in SE 103, SE 130A, SE 130B, SE 150 and SE 151A; concurrent enrollment in SE 151B; SE major.*

SE 154. Design of Timber Structures (4)
Properties of wood and lumber grades. Beam design. Design of axially loaded members. Design of beam-column. Properties of plywood and structural-use panels. Design of horizontal diaphragms. Design of shear walls. Design of nailed and bolted connections. *Prerequisites: grade of C- or better in SE 103 and SE 130A; SE major.*

SE 160A. Aerospace Structural Design (4)
Aircraft and spacecraft flight load definition and operational envelopes, metallic and composite material selection and comparison, applied elasticity, failure theories, stiffened shear panels, thin-wall open and closed-cell torsion pressure vessels, unsymmetical beam bending, shear center, and bending of plates. *Prerequisites: grade of C- or better in SE 101B (or MAE 130B) and SE 110A (or MAE 131A); priority given to engineering majors.*

SE 160B. Aerospace Structural Design (4)
Work-energy principles, statically indeterminate structures, matrix methods, application of finite element method to aerospace structures, sandwich composite structures, structural dynamics of space structures, structural stability of beams, and shells, tension field beams, wing divergence and control reversal, flutter, fasteners, and structural joints. *Prerequisites: grade of C- or better in SE 160A, and SE 101C or MAE 130C; priority given to engineering majors.*

SE 162. Composites – Materials and Manufacturing (4)
Introduction to fibers, resins, composite types, manufacturing methods, stiffness, strength, failure mechanisms, lamination theory, testing. *Prerequisites: grades of C– or better in SE 110A, SE 121, and Math 20F.* Priority enrollment given to structural engineering majors.

SE 163. Nondestructive Evaluation (4)
Damage detection, materials characterization. Introduction to nondestructive evaluation. Impedance-based methods, ultrasonics, acoustic, thermography, shearography, liquid penetrant, proof testing, stress coatings, vibrational techniques. *Prerequisites: grade of C- or better in SE 110A and SE 110B or consent of instructor; SE major.*

SE 170. Civil Structures Rehabilitation (4)
Identification of structural distress, lessons from past history, materials and structural concepts related to rehabilitation, seismic retrofit. Strengthening of beams, slabs and walls, design detailing, safety factors, fabrication/installation methods. *Prerequisites: grade of C– or better in SE 103, SE 110A, SE 130A-B, and SE 151.* Priority enrollment given to structural engineering majors.

SE 171. Aerospace Structures Repair (4)
Identification of structural distress, corrosion/stress corrosion cracking, fatigue cracking, damage tolerance, integrity and durability of built-up members, patching, health monitoring. *Prerequisites: grade of C– or better in SE 103 and SE 130A-B.* Priority enrollment given to structural engineering majors.

SE 180. Earthquake Engineering (4)
Elements of seismicity and seismology. Seismic hazards. Dynamic analysis of structures underground motion. Elastic and inelastic response spectra. Modal analysis, nonlinear time-history analysis. Earthquake resistant design. Seismic detailing. *Prerequisites: grade of C– or better in SE 110A, and SE 130A.* Priority enrollment given to structural engineering majors.

SE 181. Geotechnical Engineering (4)
General introduction to physical and engineering properties of soils. Soil classification and identification methods. Compaction and construction control. Total and effective stress. Permeability, seepage, and consolidation phenomena. Shear strength of sand and clay. *Prerequisites: grade of C- or better in SE 110A or MAE 131A; SE major.*

SE 182. Foundation Engineering (4)
Application of soil mechanics to the analysis, design, and construction of foundations for structures. Soil exploration, sampling, and in-situ testing techniques. Stress distribution and settlement of structures. Bearing capacities of shallow foundations. Axial and lateral capacity of deep foundations, earth pressures on retaining walls. *Prerequisites: grade of C- or better in SE 181; SE major.*

SE 195. Teaching (2-4)
Teaching and tutorial assistance in a SE course under supervision of instructor. Not more than four units may be used to satisfy graduation requirements. (P/NP grades only.) *Prerequisites: B average in major, upper-division standing and consent of department chair. Department stamp required.*

SE 197. Engineering Internship (1-4)
An enrichment program, available to a limited number of undergraduate students, which provides work experience with industry, government offices, etc., under the supervision of a faculty member and industrial supervisor. Coordination of the Engineering Internship is conducted through UCSD's Academic Internship Program. *Prerequisites: completion of ninety units with a 2.5 GPA and consent of department chair. Department stamp required.*

SE 198. Directed Study Group (4)
Directed group study, on a topic or in a field not included in the regular department curriculum, by special arrangement with a faculty member. (P/NP grades only.) *Prerequisite: consent of instructor or department stamp.*

SE 199. Independent Study (4)
Independent reading or research on a problem by special arrangement with a faculty member. (P/NP grades only.) *Prerequisite: consent of instructor or department stamp.*

GRADUATE

SE 201. Advanced Structural Analysis (4)
Applications of advanced analytical concepts to structural engineering problems. Effects of approximations in the descretization and the type of finite elements under consideration. An introduction is given to the nonlinear behavior of structural systems focusing on basic concepts and computational techniques. *Prerequisites: SE 130A-B or equivalent, or consent of instructor.*

SE 202. Structural Stability (4)
Static, dynamic, and energy-based techniques and predicting elastic stability. Linear and nonlinear analysis of classical and shear deformable beams and plates. Ritz, Galerkin, and finite element approaches for frames and reinforced shells. Nonconservative aerodynamic (divergence flutter) and follower forces. *Prerequisite: SE 110B or consent of instructor.*

SE 203. Structural Dynamics (4)
Response of the linear systems to harmonic, periodic and transient excitations. Duhamel's integral response spectra. Principles of dynamics, Hamilton's principle and Lagrange's equations. Linearization of the equations of motion. Free and forced vibrations. Matrix iteration, Jacobi, normal mode and frequency response method. *Prerequisites: MAE 231A-B or consent of instructor.*

SE 204. Advanced Structural Dynamics (4)
Free- and forced-vibration response of continuous systems including axial and torsional vibrations of bars and transverse vibrations of beams, membranes and plates. Differential and integral formulations of the eigenvalue problem. Perturbation and iteration methods. Introduction to structural control.

SE 206. Random Vibrations (4)
Introduction to probability theory and random processes. Dynamic analysis of linear and nonlinear structural systems subjected to stationary and nonstationary random excitations. Reliability Studies related to first excursion and fatigue failures. Applications in earthquake engineering, offshore engineering, wind engineering, and aerospace engineering. *Prerequisites: SE 203 or equivalent and basic knowledge of probability theory (e.g., SE 125).*

SE 207. Topics in Structural Engineering (4)
A course to be given at the discretion of the faculty in which topics of current interest in structural engineering will be presented.

SE 211. Advanced Reinforced and Prestressed Concrete Design (4)
Advanced topics in concrete design, including frame and shear wall structures, design of connections. reinforced and prestressed concrete system evaluation for seismic resistance including confinement and ductility requirements. Upper and lower bound theories for slab design. *Prerequisites: SE 151, or equivalent background in basic RC/PC design, or consent of instructor.*

SE 212. Advanced Structural Steel Design (4)
(Formerly AMES 245) Load and resistance factor design (LRFD) philosophy. Behavior and design of steel elements for global and local buckling. Bracing requirements for stability. Conventional and advanced analysis techniques for P-delta effects. Cyclic behavior. Ductility requirement for seismic design. Composite construction. *Prerequisites: SE 201 and SE 150, or equivalent course, or consent of instructor.*

SE 213. Bridge Design (4)
Design and analysis of bridge structures, construction methods, load conditions. Special problems in analysis—box girders, curved and skewed bridges, environmental and seismic loads. Bearings and expansion joints. Time- temperature-dependent superstructure deformations. Conceptual/preliminary bridge design project. *Prerequisites: SE 201, and fundamental courses in RC and PC design, or consent of instructor.*

SE 214. Masonry Structures (4)
Analysis and design of unreinforced and reinforced masonry structures using advanced analytical techniques and design philosophies. Material properties, stability, and buckling of unreinforced masonry. Flexural strength, shear strength, stiffness, and ductility of reinforced masonry elements. Design for seismic loads. *Prerequisites: SE 151, or equivalent basic reinforced concrete course, or consent of instructor.*

SE 221. Earthquake Engineering (4)
Introduction to plate tectonics and seismology. Rupture mechanism, measures of magnitude and intensity, earthquake occurrence and relation to geologic, tectonic processes. Probabilistic seismic hazard analysis. Strong earthquake ground motion; site effects on ground motion; structural response; soil-structure interaction; design criteria; code requirements.

SE 222. Geotechnical Earthquake Engineering (4)
Influence of soil conditions on ground motion characteristics; dynamic behavior of soils, computation of ground response using wave propagation analysis and finite element analysis; evaluation and mitigation of soil liquefaction; soil-structure interaction; lateral pressures on earth retaining structures; analysis of slope stability.

SE 223. Advanced Seismic Design of Structures (4)
Introduction to fundamental concepts in seismic design of structures. Ductility. Elastic and inelastic response. Time-history analysis. Response spectral analysis. Force- and displacement-based design. Capacity design principles. Learning from earthquake damage. Performance-based design concepts.

SE 234. Plates and Shells (4)
General mathematical formulation of the theory of thin elastic shells; linear membrane and bending theories; finite strain and rotation theories; shells of revolution; shallow shells; selected static and dynamic problems; survey of recent advances.

SE 241. Advanced Soil Mechanics (4)
Advanced treatment of topics in soil mechanics, including state of stress, pore pressure, consolidation and settlement analysis, shear strength of cohesionless and cohesive soils, mechanisms of ground improvement, and slope stability analysis. Concepts in course reinforced by laboratory experiments.

SE 242. Advanced Foundation Engineering (4)
Advanced treatment of topics in foundation engineering, including earth pressure theories, design of earth retaining structures, bearing capacity, ground improvement for foundation support, analysis and design of shallow and deep foundations, including drilled piers and driven piles.

SE 243. Soil-Structure Interaction (4)
Advanced treatment of soils interaction with structures, including shallow and deep foundations, bridge abutments, retaining walls, and buried structures subjected to static and dynamic loading. Elastic approximation. Linear and nonlinear Winkler models p-y and t-z curves.

SE 244. Numerical Methods in Geomechanics (4)
Application of the finite element method to static and dynamic analysis of geotechnical structures. One-, 2-, and 3-D seismic site response of earth structures and slopes. Pore-pressure generation and effects during cyclic loading. System identification using strong motion array data.

SE 245. Constitutive Modeling and Numerical Implementation (4)
Development and numerical implementation of procedures to model the nonlinear behavior of engineering materials, including soil and concrete. Inelastic hyperbolic and elasto-plastic modeling of hysteretic response to cyclic loading. Behavior of soil-structure systems under transient loading, such as seismic earthquake excitation, will be discussed.

SE 251. Processing Science of Composites (4)
Introduction to processing, fabrication methods; process models; materials-process-microstructure interaction; materials selection; form and quality control. Wet layup/sprayup, autoclave cure, SMC; injection molding, RTM; resin infusion; winding and fiber placement; pultrusion. Process induced defects, environmental considerations.

SE 252. Experimental Mechanics and NDE (4)
Theory of electrical resistance strain gages, full-field coherent optical methods including photoelasticity, moire' and speckle interferometry, ultrasonics, thermography and fiberoptic sensing. Applications to materials characterization, defect detection and health monitoring of structures with emphasis on fiber-reinforced composites. *Prerequisites: SE 101A, SE 110A, and MAE 131B, or consent of the instructor.*

SE 253. Mechanics of Laminated Composite Structures (4)
Macro- and micro-material modeling. Classical and shear deformable laminate beam and plate theories developed via energy principles. Ritz, Galerkin, and finite element-based solutions to static, vibration, and stability problems. Assignments include computer program development and use of existing commercial programs. *Prerequisites: SE 101C, SE 110B, and SE 162 or equivalent, or permission of the instructor.*

SE 255. Textile Composite Structures (4)
Introduction to textile structure and behavior, mechanics of yarns and fabrics as relevant to structural composites and geotechnical applications. Mechanics of textiles and fabric-based composites. Applications in fiber reinforced composites, coated textile structures, geotextiles.

SE 261. Aerospace Engineering Design (4)
Advanced topics in the design of weight-critical aerospace structures. Topics include: static, dynamic and environmental load definitions; metallics and polymeric composite material selection; semi-monocoque analysis techniques, and bolted/bonded connections. Design procedures for sizing the structural components of aircraft and spacecraft will be reviewed.

SE 262. Aerospace Structures Repair (4)
Design and analysis for repairing weight-critical aerospace structures. Identification of primary and secondary structural components, review of NASA/FAA approved repair techniques for metallic and composite structural components.

SE 271. Solid Mechanics for Structural and Aerospace Engineering (4)
Application of principles of solid mechanics to structural components and systems, description of stresses, strains, and deformation. Use of conservation equations and principle of minimum potential energy. Development of constitutive equations for metallic cementitious and polymeric materials. *Prerequisites: SE 110A, or consent of instructor.*

SE 272. Theory of Elasticity (4)
Development, formulation, and application of field equations of elasticity and variational principles for structural applications in civil and aerospace area. Use of plane stress and plane strain formulation, solution of typical boundary value problems. *Prerequisites: SE 271, or consent of instructor.*

SE 273. Theory of Plasticity and Viscoelasticity (4)
Mechanical models of viscoelastic, plastic, and viscoplastic behavior in simple shear or uniaxial stress. Constitutive relations for three-dimensional states of stress and strain. Application to selected technological problems for civil and aerospace structural applications. *Prerequisites: SE 272, or consent of instructor.*

SE 290. Seminar in Earthquake Engineering (2)
Weekly seminar and discussion by faculty, visitors, postdoctoral research fellows and graduate students concerning research topics in earthquake engineering and related subjects. May be repeated for credit. *Prerequisite: consent of instructor.* (S/U grades only.)

SE 291. Seminar in Advanced Composite Structures (2)
Weekly seminar and discussion by faculty, visitors, postdoctoral research fellows and graduate students concerning research topics in advanced composite structures and related subjects. May be repeated for credit. *Prerequisite: consent of instructor.* (S/U grades only.)

SE 296. Independent Study (4)
Prerequisite: consent of instructor.

SE 298. Directed Group Study (1-4)
Directed group study on a topic or in a field not included in regular department curriculum, by special arrangement with a faculty member. *Prerequisite: consent of instructor.*

SE 299. Graduate Research (1-12)
(S/U grades permitted.)

SE 501. Teaching Experience (2)
Teaching experience in an appropriate SE undergraduate course under direction of the faculty member in charge of the course. Lecturing one hour per week in either a problem-solving section or regular lecture. *Prerequisite: consent of instructor and the department.* (S/U grades permitted.)

English as a Second Language

OFFICE: 3232 Literature Building,
Warren College
http://esl.ucsd.edu/

Director

Margaret Loken, M.A.

The English as a Second Language Program (ESL) offers three courses designed for students whose home language is not English (ENGL 10, 11, 120).

ENGL 10–Intermediate Writing is a required course for all undergraduates who have not satisfied the Subject A requirement and who have been designated as needing the course based on their Subject A Examination. They must earn the equivalent of a C and have their instructor's recommendation to enroll in the Subject A writing course. Those who earn an equivalent of an A or B will also be recommended to take the Subject A exit exam, with the possibility of going on to their college writing program should they pass.

COURSES

10. Intermediate Writing (4)
This course is designed to provide intensive practice in the conventions of academic English to those students whose first language is not English. This course prepares students for the Subject A writing course. May be repeated once for credit, a second time for workload credit only. *Prerequisite: A department stamp is required.*

11. Writing Workshop (3)
This course is offered to any students who need additional help improving their writing. The course includes class discussion and individualized instruction, and addresses students' grammar and syntax needs.

120. ESL Writing for Graduate Students (4)
This course, designed for graduate students whose first language is not English, provides practice in the

conventions of academic writing required in specific fields of study. Students deal with common rhetorical and grammatical issues but work on writing tasks for their respective disciplines. Workload credit only. May be repeated.

500. Apprentice Teaching of ESL (1-4)
The course, designed for graduate students serving as teaching assistants, includes discussion of teaching theories, techniques, and materials under the supervision of the instructor in charge of the course.

Environmental Studies

OFFICE: 2073 Humanities and Social Sciences Building, Muir College, (858) 534-3589
http://provost.ucsd.edu/muir/instructional/environmental-studies

Faculty

Georgios H. Anagnostopoulos, Ph.D., *Professor, Philosophy*
Richard T. Carson, Jr., Ph.D., *Professor, Economics*
Pao C. Chau, Ph.D, *Professor, MAE*.
John Granger, Ph.D., *Lecturer, Literature*
Susan Kirkpatrick, Ph.D., *Literature*
James J. Moore, *Ph.D., Associate Professor, Anthropology*
Keith Pezzoli, Ph.D., *Lecturer, Director/Field Studies, Urban Studies and Planning*
Mark J. Spalding, J.D., *Lecturer, IRPS*
Shirley Strum, Ph.D., *Professor, Anthropology*
David Woodruff, Ph.D., *Professor, Biology—Ecology, Behavior and Evolution*

Minor in Environmental Studies

The minor addresses the scientific, technical, social, and cultural issues raised by the conflicting needs of the worldwide complex of preindustrial, industrial, and postindustrial societies.

Some of the courses related to the minor, particularly those in Group A, have significant prerequisites; students planning an Environmental Studies minor should check catalog course descriptions carefully. Some credit toward the minor may be gained through independent study, field research, study abroad, the Academic Internship Program, and others (prior approval strongly recommended). Petitions for petitionable courses, transfer courses, and individual additions to the courses listed below must be approved by the chair of the Environmental Studies Steering Committee. For updates, individual advising, and quarterly lists, please come to the Environmental Studies Office: Muir Interdisciplinary Studies, 2073 HSS, mail code 0106, phone (858) 534-3589.

Applicable and Petitionable Courses

Environmentally-based courses offered by UCSD departments fall into two categories: applicable and petitionable. Applicable courses are those which have been approved as always applying to the ENVR minor. Petitionable courses (identified by a # sign below) are either new and therefore not yet approved as applicable or are "topics" courses which focus on environmental matters only in particular quarters. Petitionable courses may be approved by petition to the minor during the quarters in which they appear in the ENVR quarterly lists.

Quarterly Lists

Each quarter, when the upcoming quarter's *Schedule of Classes* is published, the Environmental Studies quarterly list is available in 2073 HSS and at the Web site. It is an important, comprehensive source of information about ENVR course offerings as well as those from departments throughout the campus. It identifies applicable as well as petitionable courses for a given quarter. For reference, the office and the Web site maintain archives of quarterly lists.

The minor is structured as follows:

Required:
Environmental Studies 30, usually offered in the fall quarter.
Environmental Studies 130, usually offered in the spring quarter (need not be taken consecutively).

Required:
Five additional courses, at least four in the upper-division, from the following two groups. At least one course must be taken from Group A and one from Group B.

Group A—Natural Sciences

Biology LD 3. Organismic and Evolutionary Biology
Biology EB 120. General Ecology
Biology EB 121. General Ecology Laboratory
Biology EB 130. Introductory Marine Ecology
Biology EB 140. Biodiversity
Biology EB 176. Conservation and the Human Predicament (cross-listed with ANBI 132)
Biology EB 178. Principles of Conservation Biology
Biology EB 179. Conservation Biology Laboratory
Chemistry 15. Chemistry of the Universe
Chemistry 149A. Environmental Chemistry
Chemistry 149B. Environmental Chemistry
Chemistry 173. Atmospheric Chemistry
Earth Sciences 10. The Earth
Earth Sciences 12. History of Earth and Evolution
Earth Sciences 20. The Atmosphere
Earth Sciences 30. The Oceans
#Earth Sciences 101. Introduction to Earth and Environmental Science
Environmental Studies 102. Selected Topics in Environmental Studies (when taught from a natural sciences perspective)
Environmental Systems 101. The Living Earth
Environmental Systems 150. Environmental Perils
MAE 118A. Energy: Non-Nuclear Energy Technologies
Physics 12. Energy and the Environment
Science, Technology, Public Affairs 35. Society and the Sea

Group B—Social Sciences/Humanities

Anthropology GN 182. Origins of Agriculture and Sedentism (was ANGN 100)
Anthropology GN 160. Nature, Culture and Environmentalism
#Anthropology GN 163. Technical Revolutions and Evolution
Anthropology BI 132. Conservation and the Human Predicament (cross-listed with BIEB 176)
Communication CUL 148. Communication and the Environment
#Communication CUL 175. Advanced Topics in Communication: Culture
Economics 131. Economics of the Environment
Economics 132. Energy Economics
Economics 145. Economics of Ocean Resources
Environmental Studies 102. Selected Topics in Environmental Studies (when taught from a humanities/social sciences perspective)
Environmental Studies 110. Environmental Law
#History SC 100. Understanding the Earth/Historical Topics
#History SC 104. History of Popular Science
History SC 105A. History of Environmentalism: Ecology
History SC 105B. History of Environmentalism: Physical Systems

#History TO 121. Geographic Information Systems for Historians and Social Scientists
#History US 114. California History
#History US 117. History of Los Angeles
History US 137. The Built Environment in the Twentieth Century
History US 154. Western Environmental History (cross-listed with USP 160)
#History US 162. American West
#IRPS GN 257. Policy Analysis
#IRPS GN 290/490. Special Topics in Pacific International Affairs
IRPS GN 458. International Environmental Policy
IRPS GN 459. Conflict Resolution of Environmental Issues
#Literature EN 147. Metamorphoses of the Symbol
#Literature EN 148. Genres in English and American Literature
#Literature EN 149. Themes/English and American Literature
#Literature GN 160. Specialized Genres in Literature
#Literature WR 122. Writing for the Sciences
#Literature WR 127. General Nonfiction Prose Workshop
#Literature WR 142. Forms of Written Discourse
Philosophy 148. Philosophy and the Environment
Philosophy 164. Technology and Human Values
#Political Science 154. Special Topics in International Relations
Political Science 162. Environmental Policy
#Sociology D 185. Globalization and Social Development
Urban Studies & Planning 2. Urban World System
Urban Studies & Planning 105. Environmental and Urban Planning Problems: The U.S.-Mexico Border
Urban Studies & Planning 124. Land Use Planning
Urban Studies & Planning 144. Environmental and Preventive Health Issues
Urban Studies & Planning 160. Western Environmental History (cross-listed with HIUS 154)
Urban Studies & Planning 171. Sustainable Development
Urban Studies & Planning 175. Environmental Problems of Urban Studies
#Visual Arts 107G. Earthworks to Ecological Art
#Visual Arts 131. Special Projects in Media

#These courses satisfy minor requirements only when taught with an emphasis on environmental considerations. They must be petitioned for minor credit.

COURSES

30. Environmental Issues: Natural Sciences (4)
Examines global and regional environmental issues. The approach is to consider the scientific basis for policy options. Simple principles of chemistry and biology are introduced. The scope of problems include: air and water pollution, climate modification, solid-waste disposal, hazardous-waste treatment, and environmental impact assessment. *Prerequisite: none.*

90. Undergraduate Seminar (1)
Provides an introduction to environmental studies. Faculty members from departments in natural sciences, social sciences, and humanities offer perspectives on human interaction with the environment and the ways in which the interplay between nature and culture can be analyzed. May be repeated for credit as topics vary.

102. Selected Topics in Environmental Studies (4)
An interdisciplinary course focusing on one of a variety of topics related to environmental studies such as environmental policy and politics, foreign study in environmental problems, environmental history, nature writers, ethics and the environment. May be repeated for credit as topics vary. *Prerequisite: upper-division standing or consent of instructor.*

110. Environmental Law (4)
Explores environmental policy in the United States and the ways in which it is reflected in law. The social and political issues addressed include environmental justice and environmental racism, as well as the role of government in implementing environmental law. *Prerequisite: upper-division standing or consent of instructor.*

130. Environmental Issues: Social Sciences (4)
Explores contemporary environmental issues from the perspective of the social sciences. It includes the cultural framing of environmental issues and appropriate social action, the analysis of economic incentives and constraints, and a comparison of policy approaches. *Prerequisite: upper-division standing or consent of instructor.*

198. Directed Group Study (4)
Directed group research and study, normally with a focus on areas not otherwise covered in the curriculum. *Prerequisite: upper-division standing or consent of instructor. Department stamp required.*

500. Apprentice Teaching in Environmental Studies (4)
A course in which taching assistants are aided in learning proper teaching methods by means of supervision of their work by the faculty: handling of discussions, preparation and grading of examinations and other wirtten exercises, and student relations. *Prerequisite: graduate standing.*

Environmental Systems

Office: 188 Galbraith Hall, Revelle College

Program Faculty

Mark H. Thiemens, *Professor, Chemistry and Biochemistry, Program Director*
Jane Teranes, *Associate Director*
Donna Blackman, *Associate Researcher, SIO*
Ronald S. Burton, *Professor, Marine Biology, SIO*
Richard T. Carson, *Professor, Economics*
Colm P. Caulfield, *Assistant Professor*
Christopher D. Charles, *Professor, Oceanography, SIO*
Clark Gibson, *Associate Professor, Political Science*
Sarah T. Gille, *Assistant Professor, MAE*
Mryl C. Hendershott, *Professor, Oceanography, SIO*
William S. Hodgkiss, *Professor, Electrical Engineering, SIO*
Joshua R. Kohn, *Associate Professor, Biology*
Paul Linden, *Professor, MAE*
T. Guy Masters, *Professor, Geophysics, SIO*
Naomi Oreskes, *Associate Professor, History*
Brian Palenik, *Associate Professor, Marine Biology, SIO*
Keith Pezzoli, *Lecturer, Urban Studies and Planning*
Frank L. Powell, *Professor, Medicine/Director, White Mountain Research Station*
Jeffrey B. Remmel, *Professor, Mathematics*
Richard C. J. Somerville, *Professor, Meteorology, SIO*
Lisa Tauxe, *Professor, Geosciences, SIO*
Jeffrey R. Vincent, *Professor, Environmental Economics*

There can be little doubt that in the twenty-first century the global human community is facing a substantial growth in the environmental consequences of providing food, energy, materials, and basic services to a population of more than six billion inhabitants. The Environmental Systems Program recognizes the growing demand for environmental specialists and is designed to prepare undergraduates to enter a broad spectrum of environmental careers and graduate programs in, for example, the natural sciences, the social sciences, public policy, law, and business.

This interdisciplinary program recognizes that local, national, regional, international, and global environmental problems do not fit neatly into traditional academic departments. A measurable part of society's inability to effectively manage complex environmental problems stems from the lack of specialists who can apply analytical tools that cross disciplinary boundaries. Many environmental specialists possess little training in the natural sciences including both the fundamental ideas and methodologies of the earth

and *environmental* sciences. The environmental systems major was created to address both of these shortcomings.

To encourage and foster an interdisciplinary focus in the major, the Environmental Systems Program is supported by a wide range of UCSD faculty representing the natural sciences, the social sciences, the humanities, engineering, and medicine. The program includes a required lower-division core, an upper-division "integrating course sequence," two other upper-division courses and statistics, an advanced track, and a senior integrative project and seminar. There is a strong emphasis on a rigorous natural science foundation as well as an introduction to the policy sciences for all students enrolled in the major.

The Environmental Systems program places a significant value on interdisciplinary problem solving and all majors are expected to complete an integrative Senior Project in their final year. The Senior Project is designed by the student to focus on an interdisciplinary environmental problem or research topic. Appropriate topics for the Senior Project could conceivably include biodiversity conservation, coastal zone management, environmental health, climate change, environmental justice, and/or urban air quality. An important component of the Senior Project is an off-campus or laboratory internship where students might work on, for example, the development of a comprehensive management plan for a threatened ecosystem. The Senior Seminar provides a venue for the presentation and group evaluation of the ESYS Senior Projects.

The Environmental Systems Major

The requirements for completion of the environmental systems major include a lower-division core, two upper-division courses, a three course upper-division integrating sequence (ESYS 101, ESYS 102, ESYS 103), an upper-division statistics course, advanced courses in one of four tracks, and the senior project (ESYS 190A) and senior seminar (ESYS 190B). Any questions concerning the requirements should be directed to the associate director or the program adviser.

Students completing the advanced tracks in "Earth Sciences," "Ecology, Behavior, and Evolution," and "Environmental Chemistry" will be awarded a B.S. in environmental systems. The B.A. in environmental systems will be granted to students completing the "Environmental Policy" track within the major.

A grade-point average of 2.0 or higher in the upper-division major program is required for graduation. Students must receive a grade of C– or better in any course to be counted toward fulfillment of the major requirements. In exceptional cases, students with a grade-point average in the major of 2.5 or greater may petition to have one grade of D accepted.

LOWER-DIVISION CORE REQUIREMENTS
(Should be completed early in student's degree program.)

Biology 3—BILD 3

Chemistry 6A, 6B, 6BL, 6C—Environmental Chemistry track students must also complete Chemistry 6CL

Physics 1A, 1AL, 1B, 1BL, 1C, 1CL—Earth Sciences track students complete Physics 2A-B-C

Mathematics 10A, 10B, 10C—Earth Sciences track students may complete Math. 20A-B-C instead and Math. 20D is recommended

Economics 1A

UPPER-DIVISION CORE REQUIREMENTS

Economics 131. Economics of the Environment
Political Science 160AA. Introduction to Policy Analysis

"Integrating Course Sequence"
(Should be taken junior year.)

Environmental Systems 101. The Living Earth
Environmental Systems 102. The Solid and Fluid Earth
Environmental Systems 103. The Human Earth
Environmental Systems 190A. Senior Project (two quarters)
Environmental Systems 190B. Senior Seminar

Special Studies Courses

Special studies in the environmental systems is offered as Esys 199. This course is subject to consent of the instructor and approval by the Environmental Systems faculty adviser. This course is open to students who have accrued at least ninety quarter-units and have a GPA of least 3.0. No more than two quarters of environmental systems special studies may be counted toward any environmental systems major.

Environmental Systems Major Tracks

There are four advanced tracks in which students must complete a minimum of seven upper-division courses. Students will select courses following the requirements below in consultation with a faculty adviser.

Earth Sciences
Ecology, Behavior, and Evolution
Environmental Chemistry
Environmental Policy

It is possible to complete the requirements for any of the Environmental Systems tracks with five upper-division electives and a specialization that consists of two additional upper-division electives from any other track. For example, a student interested in the policy and scientific dimensions of habitat conservation planning for endangered species might plan a course of study to include five advanced courses from the Ecology, Behavior, and Evolution track and two advanced courses from the Environmental Policy track.

Earth Sciences Track

Required upper-division courses:

ERTH 101. Introduction to Earth and Environmental Sciences
ERTH 102. Introduction to Geochemistry
MATH 183. Statistical Methods (This statistics course, required in sophomore year)
Upper-division electives: (must complete a minimum of seven courses)

Solid Earth emphasis:

ERTH 104. Geobiology
ERTH 105. Sedimentology and Stratigraphy
ERTH 120. Introduction to Mineralogy
ERTH 130. Geodynamics of Terrestrial Planets
ERTH 144. Isotope Geochemistry
ERTH 160. Introduction to Tectonics
ERTH 162A. Introduction to Field Geology
ERTH 162L. Structural Analysis for Field Geology
ESYS 120. Science and Environmental Writing
SIO 210. Physical Oceanography
SIO 260. Marine Chemistry
SIO 240. Marine Geology
Other ERTH/SIO courses by petition

Ocean/Atmosphere emphasis:

ERTH 142. Atmospheric Chemistry and Biochemical Cycles

Chemistry 149A. Environmental Chemistry
Chemistry 173. Atmospheric Chemistry
SIO 240. Marine Geology
SIO 269. Special Topics in Marine Chemistry
SIO 280. Biological Oceanography

Other courses may be substituted by petition.

CURRICULUM GUIDE PLANNING

FALL	WINTER	SPRING
FRESHMAN		
Chem. 6A	Chem. 6B	Chem. 6C
Math. 20A	Math. 20B	Math. 20C
	BILD 3	Chem. 6BL
SOPHOMORE		
Math. 20D	Phys. 2B	Phys. 2C
(recommended)	Econ. 131	UD Esys elective
Phys. 2A	Econ. 1A	
Poli. 160AA		
JUNIOR		
ERTH 101	ERTH 102	UD ESYS elective
ESYS 101	ESYS 102	ESYS 103
Math. 183	UD ESYS elective	UD ESYS elective
SENIOR		
ESYS 190A	ESYS 190A	ESYS 190B
UD ESYS elective	UD ESYS elective	UD ESYS elective

Ecology, Behavior, and Evolution Track

Required upper-division courses:

BICD 100. Genetics
BIEB 100. Biometry (satisfies upper-division statistics requirement)

Upper-division electives [a total of seven courses required, one of which must be a lab course, selected from the courses below.] Students may satisfy some part of the upper-division elective requirements through enrollment in the Environmental Biology Program at the White Mountain Research Station (WMRS). The courses that make up this program are listed below as BIEB 170-171-172. For details contact the Environmental Systems Program office.

BIBC 100. Structural Biochemistry
BIBC 102. Metabolic Biochemistry
BIBC 103. Biochemical Techniques
BIBC 115. Computer Programming in Biology
BIBC 120. Nutrition
BIBC 130. Marine Biochemistry
BICD 110. Cell Biology
BICD 120. Fundamental of Plant Biology
BICD 130. Embryos, Genes, and Development
BICD 134. Human Reproduction and Development
BIEB 102. Introductory Ecology—Organisms and Habitats
BIEB 120. General Ecology
BIEB 121. Ecology Laboratory
BIEB 126. Plant Ecology
BIEB 132. Introduction to Marine Biology
BIEB 140. Biodiversity
BIEB 150. Evolution
BIEB 156. Population Genetics
BIEB 164. Behavioral Ecology
BIEB 166. Animal Communication
BIEB 170. Field Ecology (WMRS)
BIEB 171. Physiological Ecology (WMRS)
BIEB 172. Applied Conservation Biology (WMRS)
BIEB 176. Conservation and the Human Predicament
BIEB 178. Principles of Conservation Ecology
BIEB 179. Conservation Biology Laboratory
BIEB 180. Principles of Conservation Genetics
BIMM 100. Molecular Biology
BIMM 110. Molecular Basis of Disease
BIMM 114. Virology
BIMM 120. Bacteriology
BIMM 121. Laboratory in Microbiology
BIMM 124. Medical Microbiology
BIMM 126. Environmental Microbiology (BIMM120/BIBC 102 prerequisites ***WAIVED.***)
BIMM 127. Environmental Microbiology Laboratory
BIPN 100. Mammalian Physiology I
BIPN 102. Mammalian Physiology II
BIPN 105. Animal Physiology Lab (6)
BIPN 106. Comparative Physiology (4)
ERTH 150. Environmental Perils
ESYS 150. Science and Environmental Writing

Other courses may be substituted by petition.

CURRICULUM GUIDE PLANNING

FALL	WINTER	SPRING
FRESHMAN		
Chem. 6A	Chem. 6B	Chem. 6C
Math. 10A	Chem. 6BL	Math. 10C
	Math. 10B	BILD 3
SOPHOMORE		
Phys. 1A, 1AL	Phys. 1B, 1BL	Phys. 1C, 1CL
Econ. 1A	Econ. 131	UD ESYS elective
Poli. 160AA	BIEB 100 (statistics)	BICD 100
JUNIOR		
ESYS 101	ESYS 102	ESYS 103
UD ESYS elective lab	UD ESYS elective	UD ESYS elective
SENIOR		
ESYS 190A	ESYS 190A	ESYS 190B
UD ESYS elective	UD ESYS elective	UD ESYS Elective

Environmental Chemistry Track

Students must complete two of the following courses:

Chemistry 149A. Environmental Chemistry
Chemistry 149B. Environmental Chemistry
Chemistry 173. Atmospheric Chemistry

Students must complete:

Math. 183. Statistical Methods (This statistics course required in sophomore year) OR
Math. 186. Probability Statistics for Bioinformatics
Chemistry 140A and B. Organic Chemistry
One upper-division lab from either:
Chemistry 106. Instrumental Analysis Laboratory
Chemistry 143A. Organic Chemistry Laboratory
Two other upper-division courses, for example:
Chemistry 122. Biochemical Evolution
Chemistry 124. Bioinorganic Chemistry
Chemistry 126/127. Physical Chemistry
Chemistry 131/132/133. Physical Chemistry
Chemistry 140C. Organic Chemistry

Other courses may be substituted by petition.

CURRICULUM GUIDE PLANNING

FALL	WINTER	SPRING
FRESHMAN		
Chem. 6A	Chem. 6B	Chem. 6BL
Math. 10A	Math. 10B	Chem. 6C
BILD 3		Math. 10C
SOPHOMORE		
Chem. 6CL	Phys. 1B, BL	Phys. 1C, CL
Phys. 1A, AL	Econ. 131	Chem. 140A
Econ. 1A	Math. 183 or 186	
Poli. 160AA		
JUNIOR		
Chem. 140B	*Chem. 149B	*Chem. 173
*Chem. 149A	Chem. 106 OR	Chem. 143A
ESYS 101	ESYS 102	ESYS 103
SENIOR		
ESYS 190A	ESYS 190A	ESYS 190B
UD ESYS elective	UD ESYS elective	

* Choose (2) out of 3

Environmental Policy Track

Students complete a minimum of seven courses selected from the following list.

One upper-division *Statistics* course—Math 183. Statistical Methods or Economics 120A. Econometrics.

Economics 132. Energy Economics
Economics 125. Economics of Population Growth
Economics 116. Economic Development
Economics 130. Public Policy
Political Science 102L. The Politics of Regulation

Political Science 125. The Politics of Conservation in Developing Countries
Political Science 150A. Politics of Immigration
Political Science 160AB. Introduction to Policy Analysis
Environmental Systems 120. Science and Environmental Writing
Environmental Systems 150. Environmental Perils
IR-GN 459*. Conflict Resolution of Environmental Issues
IR-GN 488*. Corporate Strategy and the Environment
IR-GN 490*. Political Economy of Energy in Asia
IR-GN 490*. Political Economy of Energy in Latin America
IR-GN 490*. Special Topics
IR-PS 453*. Sustainable Development
IR-PS 458*. International Environmental Policy
HISC 105. History of Environmentalism
HIUS 154. Western Environmental History
ANBI 132. Conservation and the Human Predicament
Com/Cul 148. Communication and the Environment
Env. Studies 102. Selected Topics in Environmental Studies
Env. Studies 110. Environmental Law
Philosophy 148. Philosophy of the Environment
Philosophy 164. Technology and Human Values
USP 124. Land Use Planning
USP 144. Environmental and Preventive Health Issues
USP 170. Planning Theory and Practice
USP 171. Sustainable Development

Other courses may be substituted by petition.

* These graduate courses are offered through the Graduate School of International Relations and Pacific Studies. Enrollment in these courses requires the permission of the instructor.

CURRICULUM GUIDE PLANNING

FALL	WINTER	SPRING
FRESHMAN		
Chem. 6A	Chem. 6B	Chem. 6C
Math. 10A	Math. 10B	Math. 10C
	BILD 3	Chem. 6BL
SOPHOMORE		
Phys. 1A, 1AL	Phys. 1B, 1BL	Phys. 1C, 1CL
Econ. 1A	Econ. 131	Math. 183 or
Poli. 160AA		Econ. 120A
JUNIOR		
ESYS 101	ESYS 102	ESYS 103
UD ESYS elective	UD ESYS elective	UD ESYS elective
SENIOR		
ESYS 190A	ESYS 190A	ESYS 190B
UD ESYS elective	UD ESYS elective	UD ESYS elective
		UD ESYS elective

Study abroad through the Education Abroad Program or Opportunities Abroad Program can enhance a student's major, particularly as an opportunity for diverse field experiences. However, careful planning is important to meet all major requirements. Please contact the Environmental Systems Office as early as possible if you are planning to study abroad.

COURSES

Many of the courses that are used to fulfill the requirements of the environmental systems major are offered by other departments and programs. Most of these courses are offered on a regular basis. Students should consult the Schedule of Classes or contact the Environmental Systems Office in order to obtain current information. The courses below are offered directly through the Environmental Systems Program.

LOWER-DIVISION

ESYS 10. Introduction to Environmental Systems (4)
This course explores the interdisciplinary character of environmental issues through an examination of a particular topic [climate change, for example] from numerous disciplinary perspectives [e.g., biology, chemistry, physics, political science, and economics]. *Prerequisite: none.* (W)

ESYS 90. Perspectives on Environmental Issues (1)
Provides an introduction to environmental systems. Faculty members from departments in the natural sciences, geosciences, and social sciences will offer perspectives in these areas. (F)

UPPER-DIVISION

ESYS 101. The Living Earth (4)
This course will survey the basic biochemical and physiological processes governing the relationship between organisms and their environments. Fundamentals of molecular biology, enzyme reactions, photosynthesis, and central metabolic processes, mechanisms underlying homeostasis at cellular and organismal levels will be discussed with a view toward understanding the adaptations and sensitivity of biological systems to environmental perturbations. *Prerequisites: Math. 10A, 10B, 10C, BILD 3, CHEM 6A-B-C, Physics 1A, AL-B, BL-C, CL.* (F)

ESYS 102. The Solid and Fluid Earth (4)
The physical Earth system can be divided into three components: the solid earth, the liquid earth, and the atmosphere. These components are all dynamic and interact in complex ways with profound impacts on our environment. We will examine the controls of natural phenomena such as earthquakes, volcanoes, landslides, soil formation (and destruction), and changes in sea-level and climate. *Prerequisites: Math. 10A, 10B, 10C, BILD 3, CHEM 6A-B-C, Physics 1A-B-C plus either Chem/Physics lab.* (W)

ESYS 103. The Human Earth (4)
This course explores the impacts of human, social, economic, and industrial activity on the environment. It highlights the central roles in ensuring sustainable development played by market forces, technological innovation, and governmental regulation on local, national, and global scales. *Prerequisites: grade of C- or better in Math. 20B or Math. 10A-C; Physics 2B or Physics A-C; Chemistry 6B or by consent of instructor. In addition, ESYS majors, must take ESYS 101 and 102 or permission of instructor.* (S)

ESYS 120. Science and Environmental Writing (4)
Course designed to improve the written communication of science majors through frequent writing assignments that develop the practical skills needed to communicate science to lay audiences. Topics include news writing, news releases, grant writing, broadcast script writing, and editorial writing. *Prerequisites: upper-division standing in science or mathematics major and completion of college composition requirement (or consent of instructor).* (W)

ESYS 150. Environmental Perils (4)
An advanced field-oriented course for engineering and science students stressing the geologic basis for environmental perils such as earthquakes, erosion, flooding, and waste disposal. Two one-hour lectures, and a two-hour lab/field trip each week. *Prerequisites: Math. 10 A-B-C sequence and Physics 1A,AL; 1B,BL; 1C,1CL sequence or equivalent.* (S)

ESYS 190A. Senior Project (8)
All majors are required to complete an integrative Senior Project in their senior year. The Senior Project is designed by the student to focus on an interdisciplinary environmental problem or research topic and is developed either individually or as part of a team over two quarters. Appropriate topics could include biodiversity conservation, environmental health, and/or global change. An important component of the Senior Project is an off-campus or laboratory internship. *Prerequisites: ESYS 103 and upper-division standing, departmental approval, majors only.* (F,W)

ESYS 190A(W). ESYS/UCDC Senior Project (4)
ESYS majors may opt to complete the internship portion of their Senior Project through the UCDC Program. Students are expected to apply to the fall or winter quarter of UCDC Program and obtain an internship in a governmental agency, NGO, and/or research laboratory. *Prerequisites: ESYS 103 and upper-division standing, departmental approval, majors only.* (F,W)

ESYS 190B. Senior Seminar (2)
The Senior Seminar provides a venue for the presentation and group evaluation of the ESYS Senior Projects. *Prerequisite: ESYS 190A or 190A(W) (NOTE: After completing (1) quarter of ESYS 190A, ESYS 190B may be taken concurrently), senior standing.* (S)

ESYS 199. Independent Study (2-4)
Individually guided readings or projects in the area of environmental systems.

Ethnic Studies

OFFICE: Social Science Building, Rm. 201
http://www.ethnicstudies.ucsd.edu

Faculty

Robert R. Alvarez, Ph.D., *Professor and Chair*
Charles Briggs, Ph.D., *Professor and Director, Center for Iberian and Latin American Studies*
Shalanda D. Dexter-Rodgers, Ph.D., *Assistant Professor*
Yen Le Espiritu, Ph.D., *Professor*
Ross H. Frank, Ph.D., *Associate Professor*
Ramón A. Gutiérrez, Ph.D., *Chancellor's Associates Endowed Chair and Professor and Director, Center for the Study of Race and Ethnicity*
Natalia M. Molina, Ph.D., *Assistant Professor*
Lisa Sun-Hee Park, Ph.D., *Assistant Professor*
David Pellow, Ph.D., *Associate Professor and Director, California Cultures in Comparative Perspective*
Jane Rhodes, Ph.D., *Associate Professor*
Lisa E. Sanchez, Ph.D., *Assistant Professor*
Denise Ferreira da Silva, Ph.D., *Assistant Professor*
Brett St. Louis, Ph.D., *Assistant Professor*
Ana Celia Zentella, Ph.D., *Professor*

Associated Faculty

John D. Blanco, *Assistant Professor, Literature*
David Borgo, *Assistant Professor, Music*
Robert Cancel, *Associate Professor, Literature*
James Cheatham, *Senior Lecturer with Security of Employment, Emeritus, Music*
Matthew Chen, *Professor Emeritus, Linguistics*
Wayne Cornelius, *Director, Center for Comparative Immigration Studies and Professor, Political Science*
Anthony Curiel, *Associate Professor, Theatre and Dance*
Anthony Davis, *Professor, Music*
Gerald Doppelt, *Professor, Philosophy*
Steven Epstein, *Associate Professor, Sociology*
Steve Erie, *Director, Urban Studies and Planning Program and Professor, Political Science*
Ivan Evans, *Associate Professor, Sociology*
Claudio Fenner-Lopez, *Lecturer with Security of Employment Emeritus, Communication/ Visual Arts*
Camille Forbes, *Assistant Professor, Literature*
Takashi Fujitani, *Associate Professor, History*
Floyd Gaffney, *Professor Emeritus, Theatre and Dance*
Rosemary George, *Associate Professor, Critical Gender Studies Program and Literature*
Nora Gordon, *Assistant Professor, Economics*
David Gutiérrez, *Associate Professor, History*
Michael Hardimon, *Associate Professor, Philosophy*
Louis Hock, *Professor, Visual Arts*
James Holston, *Associate Professor, Anthropology*
Jorge Huerta, *Professor, Theatre and Dance*
Bennetta Jules-Rosette, *Professor, Sociology*
Nicole King, *Associate Professor, Literature*
Arend Lijphardt, *Professor Emeritus, Political Science*
James Lin, *Professor, Mathematics*
Lisa Lowe, *Professor, Literature*
Cecil Lytle, *Professor, Music*
George Mariscal, *Associate Professor, Literature*
Juan Diez Medrano, *Associate Professor, Sociology*
Michael Meeker, *Professor Emeritus, Anthropology*
Masao Miyoshi, *Professor, Literature*
Elizabeth Newsome, *Associate Professor, Visual Arts*
Edward Reynolds, *Professor, History*
Ramón Eduardo Ruíz, *Professor Emeritus, History*
Marta Sanchez, *Associate Professor, Literature*
Rosaura Sanchez, *Professor, Literature*
Gershon Shafir, *Professor, Sociology*
Nayan Shah, *Associate Professor, History*
Stephanie Smallwood, *Assistant Professor, History*
Faustina Solís, *Professor Emeritus, Urban Studies/ Family and Preventive Medicine*
Olga Vasquez, *Associate Professor, Communication*
Daniel Widener, *Assistant Professor, History*
Lisa Yoneyama, *Associate Professor, Literature*
Elana Zilberg, *Assistant Professor, Economics*

Ethnic studies is the study of the social, cultural, and historical forces that have shaped the development of America's diverse ethnic peoples over the last 500 years and which continue to shape our future. Focusing on immigration, slavery, and confinement, those three social processes that combined to create in the United States a nation of nations, ethnic studies intensively examines the histories, languages, and cultures of America's racial and ethnic minority groups in and of themselves, in their relationships to each other, and, particularly, in structural contexts of power.

The curriculum of the Department of Ethnic Studies is designed to 1) study intensively the particular histories of different ethnic and racial groups in the United States, especially intra-group stratification; 2) to draw larger theoretical lessons from comparisons among these groups; 3) to articulate general principles that shape racial and ethnic relations both currently and historically; and 4) to explore how ethnic identity is constructed and reconstructed over time both internally and externally.

A degree in ethnic studies offers training of special interest to those considering admission to graduate or professional schools and careers in education, law, medicine, public health, social work, journalism, business, city planning, politics, psychology, international relations, or creative writing. A major in ethnic studies is designed to impart fundamental skills in critical thinking, comparative analysis, social theory and research analysis, and written expression. These skills will give students the opportunity to satisfy the increasingly rigorous expectations of graduate admissions committees and prospective employers for a broad liberal arts perspective.

An ethnic studies major offers excellent preparation for teaching in the elementary schools. If you are interested in earning a California teaching credential from UCSD, contact the Teacher Education Program for information about the prerequisite and professional preparation requirements. It is recommended that you contact TEP as early as possible in your academic career.

The Major

To receive a B.A. degree with a major in ethnic studies, students must meet the following requirements:

1. A three-quarter course lower-division sequence (Ethnic Studies 1A-B-C). Ideally this sequence should be taken during the sophomore year as an intensive introduction to the history and theoretical dimensions of ethnic diversity in the United States. Ethnic Studies 1A-B-C, Introduction to Ethnic Studies, will consist of the following three courses: Population Histories of the United States, Immigration and Assimilation in American Life, Race and Ethnic Relations in the United States.
2. A minimum of twelve four-unit upper-division courses in the Department of Ethnic Studies must be completed from the following five categories:
   A. One four-unit upper-division course that intensively explores the theory and comparative methods of ethnic studies (Ethnic Studies 100: Theories and Methods of Ethnic Studies). All ethnic studies majors

Political Science 125. The Politics of Conservation in Developing Countries
Political Science 150A. Politics of Immigration
Political Science 160AB. Introduction to Policy Analysis
Environmental Systems 120. Science and Environmental Writing
Environmental Systems 150. Environmental Perils
IR-GN 459*. Conflict Resolution of Environmental Issues
IR-GN 488*. Corporate Strategy and the Environment
IR-GN 490*. Political Economy of Energy in Asia
IR-GN 490*. Political Economy of Energy in Latin America
IR-GN 490*. Special Topics
IR-PS 453*. Sustainable Development
IR-PS 458*. International Environmental Policy
HISC 105. History of Environmentalism
HIUS 154. Western Environmental History
ANBI 132. Conservation and the Human Predicament
Com/Cul 148. Communication and the Environment
Env. Studies 102. Selected Topics in Environmental Studies
Env. Studies 110. Environmental Law
Philosophy 148. Philosophy of the Environment
Philosophy 164. Technology and Human Values
USP 124. Land Use Planning
USP 144. Environmental and Preventive Health Issues
USP 170. Planning Theory and Practice
USP 171. Sustainable Development

Other courses may be substituted by petition.

* These graduate courses are offered through the Graduate School of International Relations and Pacific Studies. Enrollment in these courses requires the permission of the instructor.

CURRICULUM GUIDE PLANNING

FALL	WINTER	SPRING
FRESHMAN		
Chem. 6A	Chem. 6B	Chem. 6C
Math. 10A	Math. 10B	Math. 10C
	BILD 3	Chem. 6BL
SOPHOMORE		
Phys. 1A, 1AL	Phys. 1B, 1BL	Phys. 1C, 1CL
Econ. 1A	Econ. 131	Math. 183 or Econ. 120A
Poli. 160AA		
JUNIOR		
ESYS 101	ESYS 102	ESYS 103
UD ESYS elective	UD ESYS elective	UD ESYS elective
SENIOR		
ESYS 190A	ESYS 190A	ESYS 190B
UD ESYS elective	UD ESYS elective	UD ESYS elective
		UD ESYS elective

Study abroad through the Education Abroad Program or Opportunities Abroad Program can enhance a student's major, particularly as an opportunity for diverse field experiences. However, careful planning is important to meet all major requirements. Please contact the Environmental Systems Office as early as possible if you are planning to study abroad.

COURSES

Many of the courses that are used to fulfill the requirements of the environmental systems major are offered by other departments and programs. Most of these courses are offered on a regular basis. Students should consult the Schedule of Classes or contact the Environmental Systems Office in order to obtain current information. The courses below are offered directly through the Environmental Systems Program.

LOWER-DIVISION

ESYS 10. Introduction to Environmental Systems (4)
This course explores the interdisciplinary character of environmental issues through an examination of a particular topic [climate change, for example] from numerous disciplinary perspectives [e.g., biology, chemistry, physics, political science, and economics]. *Prerequisite: none.* (W)

ESYS 90. Perspectives on Environmental Issues (1)
Provides an introduction to environmental systems. Faculty members from departments in the natural sciences, geosciences, and social sciences will offer perspectives in these areas. (F)

UPPER-DIVISION

ESYS 101. The Living Earth (4)
This course will survey the basic biochemical and physiological processes governing the relationship between organisms and their environments. Fundamentals of molecular biology, enzyme reactions, photosynthesis, and central metabolic processes, mechanisms underlying homeostasis at cellular and organismal levels will be discussed with a view toward understanding the adaptations and sensitivity of biological systems to environmental perturbations. *Prerequisites: Math. 10A, 10B, 10C, BILD 3, CHEM 6A-B-C, Physics 1A, AL-B, BL-C, CL.* (F)

ESYS 102. The Solid and Fluid Earth (4)
The physical Earth system can be divided into three components: the solid earth, the liquid earth, and the atmosphere. These components are all dynamic and interact in complex ways with profound impacts on our environment. We will examine the controls of natural phenomena such as earthquakes, volcanoes, landslides, soil formation (and destruction), and changes in sea-level and climate. *Prerequisites: Math. 10A, 10B, 10C, BILD 3, CHEM 6A-B-C, Physics 1A-B-C plus either Chem/Physics lab.* (W)

ESYS 103. The Human Earth (4)
This course explores the impacts of human, social, economic, and industrial activity on the environment. It highlights the central roles in ensuring sustainable development played by market forces, technological innovation, and governmental regulation on local, national, and global scales. *Prerequisites: grade of C– or better in Math. 20B or Math. 10A-C; Physics 2B or Physics A-C; Chemistry 6B or by consent of instructor. In addition, ESYS majors, must take ESYS 101 and 102 or permission of instructor.* (S)

ESYS 120. Science and Environmental Writing (4)
Course designed to improve the written communication of science majors through frequent writing assignments that develop the practical skills needed to communicate science to lay audiences. Topics include news writing, news releases, grant writing, broadcast script writing, and editorial writing. *Prerequisites: upper-division standing in science or mathematics major and completion of college composition requirement (or consent of instructor).* (W)

ESYS 150. Environmental Perils (4)
An advanced field-oriented course for engineering and science students stressing the geologic basis for environmental perils such as earthquakes, erosion, flooding, and waste disposal. Two one-hour lectures, and a two-hour lab/field trip each week. *Prerequisites: Math. 10 A-B-C sequence and Physics 1A,AL; 1B,BL; 1C,1CL sequence or equivalent.* (S)

ESYS 190A. Senior Project (8)
All majors are required to complete an integrative Senior Project in their senior year. The Senior Project is designed by the student to focus on an interdisciplinary environmental problem or research topic and is developed either individually or as part of a team over two quarters. Appropriate topics could include biodiversity conservation, environmental health, and/or global change. An important component of the Senior Project is an off-campus or laboratory internship. *Prerequisites: ESYS 103 and upper-division standing, departmental approval, majors only.* (F,W)

ESYS 190A(W). ESYS/UCDC Senior Project (4)
ESYS majors may opt to complete the internship portion of their Senior Project through the UCDC Program. Students are expected to apply to the fall or winter quarter of UCDC Program and obtain an internship in a governmental agency, NGO, and/or research laboratory. *Prerequisites: ESYS 103 and upper-division standing, departmental approval, majors only.* (F,W)

ESYS 190B. Senior Seminar (2)
The Senior Seminar provides a venue for the presentation and group evaluation of the ESYS Senior Projects. *Prerequisite: ESYS 190A or 190A(W) (NOTE: After completing (1) quarter of ESYS 190A, ESYS 190B may be taken concurrently), senior standing.* (S)

ESYS 199. Independent Study (2-4)
Individually guided readings or projects in the area of environmental systems.

Ethnic Studies

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http://www.ethnicstudies.ucsd.edu

Faculty

Robert R. Alvarez, Ph.D., *Professor and Chair*
Charles Briggs, Ph.D., *Professor and Director, Center for Iberian and Latin American Studies*
Shalanda D. Dexter-Rodgers, Ph.D., *Assistant Professor*
Yen Le Espiritu, Ph.D., *Professor*
Ross H. Frank, Ph.D., *Associate Professor*
Ramón A. Gutiérrez, Ph.D., *Chancellor's Associates Endowed Chair and Professor and Director, Center for the Study of Race and Ethnicity*
Natalia M. Molina, Ph.D., *Assistant Professor*
Lisa Sun-Hee Park, Ph.D., *Assistant Professor*
David Pellow, Ph.D., *Associate Professor and Director, California Cultures in Comparative Perspective*
Jane Rhodes, Ph.D., *Associate Professor*
Lisa E. Sanchez, Ph.D., *Assistant Professor*
Denise Ferreira da Silva, Ph.D., *Assistant Professor*
Brett St. Louis, Ph.D., *Assistant Professor*
Ana Celia Zentella, Ph.D., *Professor*

Associated Faculty

John D. Blanco, *Assistant Professor, Literature*
David Borgo, *Assistant Professor, Music*
Robert Cancel, *Associate Professor, Literature*
James Cheatham, *Senior Lecturer with Security of Employment, Emeritus, Music*
Matthew Chen, *Professor Emeritus, Linguistics*
Wayne Cornelius, *Director, Center for Comparative Immigration Studies and Professor, Political Science*
Anthony Curiel, *Associate Professor, Theatre and Dance*
Anthony Davis, *Professor, Music*
Gerald Doppelt, *Professor, Philosophy*
Steven Epstein, *Associate Professor, Sociology*
Steve Erie, *Director, Urban Studies and Planning Program and Professor, Political Science*
Ivan Evans, *Associate Professor, Sociology*
Claudio Fenner-Lopez, *Lecturer with Security of Employment Emeritus, Communication/ Visual Arts*
Camille Forbes, *Assistant Professor, Literature*
Takashi Fujitani, *Associate Professor, History*
Floyd Gaffney, *Professor Emeritus, Theatre and Dance*
Rosemary George, *Associate Professor, Critical Gender Studies Program and Literature*
Nora Gordon, *Assistant Professor, Economics*
David Gutiérrez, *Associate Professor, History*
Michael Hardimon, *Associate Professor, Philosophy*
Louis Hock, *Professor, Visual Arts*
James Holston, *Associate Professor, Anthropology*
Jorge Huerta, *Professor, Theatre and Dance*
Bennetta Jules-Rosette, *Professor, Sociology*
Nicole King, *Associate Professor, Literature*
Arend Lijphardt, *Professor Emeritus, Political Science*
James Lin, *Professor, Mathematics*
Lisa Lowe, *Professor, Literature*
Cecil Lytle, *Professor, Music*
George Mariscal, *Associate Professor, Literature*
Juan Diez Medrano, *Associate Professor, Sociology*
Michael Meeker, *Professor Emeritus, Anthropology*
Masao Miyoshi, *Professor, Literature*
Elizabeth Newsome, *Associate Professor, Visual Arts*
Edward Reynolds, *Professor, History*
Ramón Eduardo Ruíz, *Professor Emeritus, History*
Marta Sanchez, *Associate Professor, Literature*
Rosaura Sanchez, *Professor, Literature*
Gershon Shafir, *Professor, Sociology*
Nayan Shah, *Associate Professor, History*
Stephanie Smallwood, *Assistant Professor, History*
Faustina Solís, *Professor Emeritus, Urban Studies/ Family and Preventive Medicine*
Olga Vasquez, *Associate Professor, Communication*
Daniel Widener, *Assistant Professor, History*
Lisa Yoneyama, *Associate Professor, Literature*
Elana Zilberg, *Assistant Professor, Economics*

Ethnic studies is the study of the social, cultural, and historical forces that have shaped the development of America's diverse ethnic peoples over the last 500 years and which continue to shape our future. Focusing on immigration, slavery, and confinement, those three social processes that combined to create in the United States a nation of nations, ethnic studies intensively examines the histories, languages, and cultures of America's racial and ethnic minority groups in and of themselves, in their relationships to each other, and, particularly, in structural contexts of power.

The curriculum of the Department of Ethnic Studies is designed to 1) study intensively the particular histories of different ethnic and racial groups in the United States, especially intra-group stratification; 2) to draw larger theoretical lessons from comparisons among these groups; 3) to articulate general principles that shape racial and ethnic relations both currently and historically; and 4) to explore how ethnic identity is constructed and reconstructed over time both internally and externally.

A degree in ethnic studies offers training of special interest to those considering admission to graduate or professional schools and careers in education, law, medicine, public health, social work, journalism, business, city planning, politics, psychology, international relations, or creative writing. A major in ethnic studies is designed to impart fundamental skills in critical thinking, comparative analysis, social theory and research analysis, and written expression. These skills will give students the opportunity to satisfy the increasingly rigorous expectations of graduate admissions committees and prospective employers for a broad liberal arts perspective.

An ethnic studies major offers excellent preparation for teaching in the elementary schools. If you are interested in earning a California teaching credential from UCSD, contact the Teacher Education Program for information about the prerequisite and professional preparation requirements. It is recommended that you contact TEP as early as possible in your academic career.

The Major

To receive a B.A. degree with a major in ethnic studies, students must meet the following requirements:

1. A three-quarter course lower-division sequence (Ethnic Studies 1A-B-C). Ideally this sequence should be taken during the sophomore year as an intensive introduction to the history and theoretical dimensions of ethnic diversity in the United States. Ethnic Studies 1A-B-C, Introduction to Ethnic Studies, will consist of the following three courses: Population Histories of the United States, Immigration and Assimilation in American Life, Race and Ethnic Relations in the United States.
2. A minimum of twelve four-unit upper-division courses in the Department of Ethnic Studies must be completed from the following five categories:
   A. One four-unit upper-division course that intensively explores the theory and comparative methods of ethnic studies (Ethnic Studies 100: Theories and Methods of Ethnic Studies). All ethnic studies majors

should complete this course before proceeding with the other requirements listed below.

B. Four upper-division ethnic studies history and social science courses from those listed below:

ETHN 103: Environmental Racism
ETHN 104: Race, Space, and Segregation
ETHN 105: Ethnic Diversity and the City
ETHN 106: Ethnoracial Transformations of U.S. Communities
ETHN 107: Field Work in Racial and Ethnic Communities
ETHN 108: Race, Culture, and Social Change
ETHN 109: Race and Social Movements
ETHN 112A: History of Native Americans in the United States I
ETHN 112B: History of Native Americans in the United States II
ETHN 116: The United States-Mexico Border in Comparative Perspective
ETHN 117: Organic Social Movements
ETHN 118: Contemporary Immigration Issues
ETHN 119: Multiracial Societies in the Americas
ETHN 120: Comparative Asian-American History, 1850–1965
ETHN 121: Contemporary Asian-American History
ETHN 123: Asian-American Politics
ETHN 125: Asian-American History
ETHN 129: Asian and Latina Immigrant Workers in the Global Economy
ETHN 130: Social and Economic History of the Southwest I
ETHN 131: Social and Economic History of the Southwest II
ETHN 134: Immigration and Ethnicity in Modern American Society
ETHN 149: African American History in the Twentieth Century
ETHN 150: Politics of Cultural Pluralism and National Integration
ETHN 151: Ethnic Politics in America
ETHN 152: Law and Civil Rights
ETHN 159: Topics in African American History
ETHN 160: Black Politics and Protest in the Early 20th Century (1885–1941)
ETHN 161: Black Politics and Protest Since 1941
ETHN 162: Cultural Contact and Exchange
ETHN 163: Leisure in Urban America
ETHN 165: Sex and Gender in African American Communities
ETHN 167: African-American History in War and Peace: 1917 to the Present
ETHN 170A: Origins of the Atlantic World, c. 1450–1650
ETHN 170B: Slavery and the Atlantic World
ETHN 183: Gender, Race, Ethnicity, and Class
ETHN 188: African Americans, Religion, and the City
ETHN 197: Field Work in Racial and Ethnic Communities*
ETHN 198: Directed Group Studies*
ETHN 199: Supervised Independent Study and Research*

*Only two will be counted in fulfillment of this requirement.

Colloquia

ETHN 180: Topics in Mexican-American History
ETHN 181: Topics in the Comparative History of Modern Slavery
ETHN 182: Segregation, Freedom Movements, and the Crisis of the Twentieth Century
ETHN 184: Black Intellectuals in the Twentieth Century
ETHN 187: Black Nationalism
ETHN 189: Special Topics in Ethnic Studies

C. At least three upper-division courses that focus on language, ethnicity, and institutional discourses:

ETHN 140: Language and American Ethnicity
ETHN 141: Language, Culture, and Inequality
ETHN 142: Medicine, Race, and the Global Politics of Inequality
ETHN 144: Bilingual Communities in the U.S.A.
ETHN 145: Spanish Language in the United States
ETHN 164: African Americans and the Mass Media
ETHN 166: The Black Press and Social Change
ETHN 185: Discourse, Power, and Inequality
ETHN 186: The Ethnic Press in the United States

Students may petition to count one course on language, ethnicity, and institutional discourses offered by other departments. In addition, one course in foreign language at the upper-division level may be counted in partial fulfillment of this requirement, with the consent of the department. Students must seek faculty advice on which courses would best satisfy the requirement and yield the most rigorous training.

D. At least three upper-division ethnic studies courses on the literature and cultural expressions of American racial and ethnic minorities:

ETHN 101: Ethnic Images in Film
ETHN 110: Cultural World Views of Native Americans
ETHN 111: Native American Literature
ETHN 122: Asian-American Culture and Identity
ETHN 124: Asian-American Literature
ETHN 128: Hip Hop: The Politics of Culture
ETHN 132: Chicano Dramatic Literature
ETHN 133: Hispanic-American Dramatic Literature
ETHN 135A: Early Latino/a-Chicano/a Cultural Production: 1848 to 1960
ETHN 135B: Contemporary Latino/a-Chicano/a Cultural Production: 1960 to Present
ETHN 136: Topics in Chicano/a-Latino/a Cultures
ETHN 138: Chicano/a-Latino/a Poetry
ETHN 139: Chicano Literature in English
ETHN 146A: Theatrical Ensemble
ETHN 148: Latino/a and Chicano/a Literature

ETHN 168: Comparative Ethnic Literature

ETHN 172: Afro-American Prose

ETHN 173: Afro-American Poetry

ETHN 174: Themes in Afrc-American Literature

ETHN 175: Literature of the Harlem Renaissance

ETHN 176: Black Music/Black Texts: Communication and Cultural Expression

ETHN 178: Blues: An Oral Tradition

ETHN 179A: Jazz Roots and Early Development (1900–1943)

ETHN 179B: Jazz Since 1946: Freedom and Form

E. One four-unit field methods course (Ethnic Studies 190: Research Methods: Studying Ethnic and Racial Communities).

3. Since the goal of the Department of Ethnic Studies is to intensively study both the particular histories of various ethnic and racial groups in the United States and to draw larger theoretical lessons from comparisons among and between groups, students may not fulfill requirements 2B and 2D by focusing all of the seven required courses on only one ethnic or racial group.
4. Ethnic studies majors, including students who are double majors, may petition up to four upper-division courses to fulfill major requirements as long as each of the following three conditions are met for each course: 1) the course is taken from another UCSD department, taken from a UCSD approved study abroad program, or taken at another UC campus; 2) the coursework is appropriate to the ethnic studies major; and 3) the student completes at least one course offered by the UCSD ethnic studies department in each of the five upper-division categories.
5. To satisfy the requirements for the major, lower- and upper-division courses must be completed with a P, C-, or better grade.
6. Except for independent study course electives (ETHN 197, 198, or 199) which are always taken with a Pass/No Pass grade option, students majoring in ethnic studies may take up to two courses, either lower- or upper-division, with a Pass/No Pass option.

The Honors Program

Consistent with other research opportunities offered to undergraduates on the UCSD campus, the department offers the Honors Program to ethnic studies majors in their senior or junior year the opportunity to conduct original research using interdisciplinary methodologies in the comparative study of race and ethnicity. To enroll in the Honors Program, an undergraduate must have a minimum grade-point average of 3.5 in ethnic studies classes counted towards the major. Students with a GPA lower than 3.5 in the major may be admitted by exception if they show promise of success in research.

The Honors Program will be an extension of current departmental offerings using existing faculty resources. Ethnic studies and affiliated faculty will choose to advise students who successfully complete ETHN 191 and continue in the Honors Program based on related research interests. The student will enroll in ETHN 192 and ETHN 193 and work with the appropriate faculty adviser. Students will present their research projects at the annual Ethnic Studies Honors Symposium in June. Students who complete the sequence ETHN 191, ETHN 192, and ETHN 193 will receive one credit towards the "B" (Social Studies/Humanities) requirements for the ethnic studies major. Students who complete their research project with a grade of "B" or better and maintain a minimum 3.25 GPA in the ethnic studies major will receive "Distinction" in the major upon graduation from UCSD. Ethnic Studies 191, 192, and 193 must be taken for letter grade only.

191. Undergraduate Research in Ethnic Studies (4)
This course is designed to help students conduct their own research rather than merely read the research of others. The course will introduce students to research paradigms in ethnic studies, familiarize them with finding aids and other library resources, and involve them in the design of research plans.

192. Honors Research in Ethnic Studies (4)
This course is a continuation of Ethnic Studies 191-Undergraduate Research in Ethnic Studies. Students who have completed ETHN 191 and selected a faculty research adviser may enroll in this course. During the quarter the research for the honors project will be completed under the faculty adviser's supervision. Faculty advisers will meet weekly with their honors students to oversee the progress made in carrying out the plan of research.

193. Honors Research in Ethnic Studies (4)
This course is a continuation of Ethnic Studies 192 Honors Research in Ethnic Studies. Students who have completed ETHN 192 and are continuing to work with a faculty research adviser may enroll in this course. During the quarter the written drafts and final honors paper will be completed under the faculty adviser's supervision. The student will meet weekly with the faculty adviser in order to prepare drafts and the final version of the honors paper.

Education Abroad Program

Students are able to participate in the UC Education Abroad Program (EAP) or UCSD's Opportunities Abroad Program (OAP) while still making progress toward completing their major. Students considering this option should discuss their plans with the undergraduate adviser prior to going abroad, and courses taken abroad must be approved by the department. Interested students should contact the Programs Abroad Office in the International Center.

The Minor

Students may minor in ethnic studies. Consistent with the provision for a minor curriculum for students entering after January 1, 1998, students wishing to minor in ethnic studies must satisfy the following requirements:

1) Students must take two four-unit courses in the history and theoretical dimensions of ethnic diversity in the United States from the lower division sequence (Ethnic Studies 1A-B-C); or students must take two four-unit upper-division courses in analytic and comparative study of ethnicity: Theories and Methods of Ethnic Studies (ETHN 100), and Research Methods: Studying Ethnic and Racial Communities (ETHN 190).

2) Students must take five four-unit upper-division ethnic studies elective courses; at least two, but no more than three of the five elective courses must be selected from either the ethnic studies history and social studies courses (listed above in section 2B) or the ethnic studies literature and cultural expressions courses (listed above in section 2D). While language and ethnicity courses offered by the department (listed above in section 2C) may also be used to satisfy this requirement, foreign language and area studies courses from other departments may not. No more than two independent study courses (ETHN 197, 198, or 199) may be used to satisfy this requirement.

3) To satisfy the requirements for the minor, lower- and upper-division courses must be completed with a P, C-, or better grade.

4) Except for independent study course electives (ETHN 197, 198, or 199) which are always taken with a Pass/No Pass grade option, students minoring in ethnic studies may take one course, either lower- or upper-division, with a Pass/No Pass grade option.

Students interested in the African-American experience should consider the following courses:

ETHN 149: African American History in the Twentieth Century

ETHN 159: Topics in African American History

ETHN 160: Black Politics and Protest in the Early 20th Century (1885–1941)

ETHN 161: Black Politics and Protest Since 1941

ETHN 164: African Americans and the Mass Media

ETHN 165: Sex and Gender in African American Communities

ETHN 166: The Black Press and Social Change

ETHN 167: African-American History in War and Peace: 1917 to the Present

ETHN 170A: Origins of the Atlantic World, c. 1450–1650

ETHN 170B: Slavery and the Atlantic World

ETHN 172: Afro-American Prose

ETHN 173: Afro-American Poetry

ETHN 174: Themes in Afro-American Literature

ETHN 175: Literature of the Harlem Renaissance

ETHN 176: Black Music/Black Texts: Communication and Cultural Expression

ETHN 178: Blues: An Oral Tradition

ETHN 179A: Jazz Roots and Early Development (1900–1943)

ETHN 179B: Jazz Since 1946: Freedom and Form

ETHN 181: Topics in the Comparative History of Modern Slavery

ETHN 182: Segregation, Freedom Movements, and the Crisis of the Twentieth Century

ETHN 184: Black Intellectuals in the Twentieth Century

ETHN 187: Black Nationalism

ETHN 188: African Americans, Religion, and the City

Students interested in the Chicano experience should consider the following courses:

ETHN 116: The United States-Mexico Border in Comparative Perspective

ETHN 130: Social and Economic History of the Southwest I

ETHN 131: Social and Economic History of the Southwest II

ETHN 132: Chicano Dramatic Literature

ETHN 133: Hispanic-American Dramatic Literature

ETHN 135A: Early Latino/a-Chicano/a Cultural Production: 1848 to 1960

ETHN 135B: Contemporary Latino/a-Chicano/a Cultural Production: 1960 to Present

ETHN 136: Topics in Chicano/a-Latino/a Cultures

ETHN 138: Chicano/a-Latino/a Poetry

ETHN 139: Chicano Literature in English

ETHN 145: Spanish Language in the United States

ETHN 148: Latino/a and Chicano/a Literature

ETHN 180: Topics in Mexican American History

Students interested in the Asian-American experience should consider the following courses:

ETHN 120: Comparative Asian-American History

ETHN 121: Contemporary Asian-American History

ETHN 122: Asian-American Culture and Identity

ETHN 123: Asian-American Politics

ETHN 124: Asian-American Literature

ETHN 125: Asian-American History

Students interested in the Native American experience should consider the following courses:

ETHN 110: Cultural World Views of Native Americans

ETHN 111: Native American Literature

ETHN 112A: History of Native Americans in the United States I

ETHN 112B: History of Native Americans in the United States II

SocD 181i: The Sociology of Indian-White Relations

The Graduate Program

The UCSD Department of Ethnic Studies emphasizes comparative, analytic, and relational study of ethnicity and race in the United States. Our fields of emphasis include intercultural communication and conflict, population histories of the Americas, ethnicity and identity, immigration and assimilation, ethnic politics and social movements, race and racism, urban ethnicity, gender and ethnicity, sexuality, intellectual and cultural histories of ethnic groups, cultural pluralism, national integration, language and ethnic life, and mass media representations of ethnic identity.

Admission

New students are admitted in the fall quarter of each academic year. Prospective applicants should submit the official application for admission and awards (same form), one set of official transcripts from each institution attended after high school, official scores from the Graduate Record Examination, application fee, at least three letters of recommendation, and one or more samples of the applicant's own writing, such as term papers. Additionally, foreign applicants must submit official scores from the Test of English as a Foreign Language (TOEFL). Applicants are encouraged to visit the department to talk with faculty and graduate students. The application deadline is January 15.

Program of Study

Students are required to enroll as full-time graduate students, to carry a minimum enrollment of twelve units of graduate-level courses each quarter, and to maintain a grade-point average of 3.2 or better. To obtain an M.A. degree students must take fifty-one units of course work and write a master's thesis.

Core Curriculum Sequence Requirements

1. **Ethnic Studies 200A-B-C, Core Seminar**
   All graduate students will be required to take the introductory three-quarter core seminar (four units each, twelve units total) during their

first year in the program. This course covers ethnic studies theory , the history of ethnic studies, and controversies in ethnic studies.

2. **Ethnic Studies 210, Research Seminar**
   During the first year of graduate study, all students will be required to take (1) one-quarter of the research seminar (4 units). This course introduces students to the practice of original discovery research in the field of racial and ethnic studies, including articulating a research problem, placing it within theoretical discussions, selecting appropriate methods, and analyzing data.
3. **Ethnic Studies 230, Department Colloquium**
   During the first two years of graduate study, all students will be required to enroll in three one-quarter colloquia required by the department. In Ethnic Studies 230, department faculty and visiting lecturers will make presentations about research in progress in our field. This colloquium is a one-unit course and must be taken for a total of three quarters.
4. **Ethnic Studies 240, Multidisciplinary Research Methods in Ethnic Studies**
   During the first two years of graduate study, students must enroll in two (2) four-unit disciplinary methods courses. The first course must be Ethnic Studies 240; Multidisciplinary Research Methods in Ethnic Studies. Depending upon the student's research interests, the second course will be selected (in consultation with the student's graduate adviser) from those graduate methods courses offered by UCSD Humanities and Social Science Departments.
5. **Ethnic Studies 290A-B, Master's Thesis Preparation**
   Students are required to write a master's thesis as part of the requirements for the master of arts in ethnic studies. Students should enroll in thesis preparation courses in the fall and spring quarters of the second year of graduate studies.

Foreign Language Requirement

Competence in one or more foreign languages is encouraged but not required at the M.A. level. All doctoral candidates must satisfy the department's graduate committee that they have adequate linguistic competence in one foreign language relevant to their area of research by translating three pages of scholarly text written in the designated foreign language. The graduate committee may waive the language requirement and test the candidate on other specialized skills in instances where knowledge of a foreign language is not relevant to the candidate's areas of research.

Instruction in Quantification

The department encourages graduate students to employ quantitative methods where appropriate. Instruction in quantitative methods can fulfill elective requirements; recommended courses include Sociology 205 and 206—Survey and Demographic Methods, Political Science 270—Quantitative Methods in Political Science. In cases where a reading knowledge of evidence assembled through quantitative methods would be useful, students who obtain the permission of the director of Graduate Studies may fulfill elective requirements by taking no more than two selected undergraduate courses including Sociology 103—Computer Applications to Data Management in Sociology, Sociology 107—Demographic Methods, Sociology 108—Quantitative Analysis of Survey Data, Sociology 109—Quantitative Analysis of Sociological Data, Political Science 170—Quantitative Political Science, among others.

The Master's Degree

Students entering the ethnic studies doctoral program must first complete a master's degree before continuing toward the doctorate. University regulations prohibit entering students who already have a master's degree in ethnic studies from receiving a second master's degree. Nonetheless, students who are admitted to the ethnic studies doctoral program with a master's degree must complete all the requirements for the ethnic studies master of arts degree. The M.A. will also be a terminal degree for those students denied admission to candidacy.

To obtain the M.A. degree, students must complete the department's course requirements satisfactorily. At the end of the second year in the graduate program, students must submit a written thesis to their Master's Thesis Committee (MTC). The committee will assess the quality of the work and determine whether it demonstrates the likelihood of success in conducting doctoral research.

The final decision regarding the M.A. degree is based on grades, the master's thesis, and yearly faculty evaluations. The Graduate Program Committee awards three possible grades: Pass, M.A. Only, and No Pass. All passing students (with the exception of those who already have a master's degree in ethnic studies from another institution) receive the master of arts degree and proceed in their course of studies for the doctorate. Students who receive M.A. Only evaluations gain the master's degree but may not continue in the department's Ph.D. program. Students who receive a No Pass evaluation must withdraw from the program without a graduate degree. The master's degree is earned as one of the requirements for the Ph.D. and is based on the quality of the student's work during the first two years in the graduate program. At the end of the second year, students are evaluated by the Graduate Program Committee for the master's degree. At that time, the committee (GPC) ascertains the student's suitability for doctoral work and recommends either advancement to Ph.D. work or termination.

Requirements for the Qualifying Examinations

When students complete all the core curriculum requirements and have taken five four-unit elective courses in appropriate areas or disciplines, they are eligible to take the qualifying examination for the Ph.D. degree. Students will be encouraged to take the exam by the end of their third year in the program, but this examination must be completed by the end of the student's fourth year in the program. The qualifying exam is both written and oral; it consists of two parts. Part one tests the student's basic competence and knowledge of ethnic studies scholarship as spelled out in the Department of Ethnic Studies required graduate reading list. The reading list will be distributed to every student entering the graduate program. Over the next three years, students are required to read all of these books and articles, and to have their mastery of these readings tested during the qualifying examination. Part two of the examination requires the submission of a dissertation prospectus. The dissertation prospectus is a written document that 1) specifies the dissertation research topic; 2) places the dissertation research in the context of the relevant literature in the field; 3) identifies the significance of the project as original discovery scholarship; 4) explains and justifies the research methods to be employed; 5) establishes the feasibility of the research and identifies the primary sources or data bases to be used;6) indicates the anticipated steps leading to completion of the project; and 7) provides a timetable for the research and writing phases of the project.

The Doctoral Committee consists of five persons proposed by the student and accepted by the department chair and the office of Graduate Studies and Research according to graduate council regulations. A sixth member of the committee may be added with the approval of the department chair. Students are expected to select the chair of their examination committee by the winter quarter of the third year of study. The chair of the Ph.D. Examination Committee serves as the student's adviser for the remainder of the student's graduate program. Three of the Examination Committee members must be Department of Ethnic Studies faculty; the other two must be from other departments.

Fourteen days before the scheduled qualifying examination, the student must submit the written dissertation prospectus to the examination committee. On this same day, the student will receive from the chair of the examination committee a three-question written exam testing knowledge of the required graduate reading list. Seven days before the scheduled qualifying examination, the student must submit written answers to the questions that have been posed, distributing copies of these essays to all examination committee members. A two-hour oral examination will occur on the appointed date. At the two-hour oral exam, the student will answer questions posed by the committee about the student's dissertation prospectus, mastery of the required graduate reading list, answers to the written part of the exam, and comprehensive knowledge of ethnic studies scholarship. Based on written papers and on oral performance, three possible grades will be selected by the examination committee: No Pass, Pass, and High Pass. Students who receive a No Pass must retake the qualifying examination within one year and obtain a Pass grade to remain in the doctoral program.

The Doctoral Dissertation

Once students pass the qualifying exam, they may begin dissertation research. Students are expected to consult with their committee members on a regular basis during the research process.

All doctoral students will be evaluated annually by the doctoral committee and given a written report signed by the thesis adviser according to campus policy.

When the dissertation has been substantially completed and once committee members have had the opportunity to review drafts of the written work, the committee meets (with or without the student present at the discretion of the committee chair) to consider the progress made and to identify concerns, changes to be made, or further research to be done. Once the committee members are substantially satisfied with the written work, the student, in consultation with the committee, schedules the oral defense of the dissertation. By university regulation, the defense is open to the public.

The final version of the dissertation must be approved by each member of the doctoral committee. Having successfully defended the dissertation in oral examination, the student is eligible to receive the Ph.D. degree. The final version of the dissertation is then filed with the university librarian via the office of Graduate Studies and Research. Acceptance of the dissertation by the university librarian is the final step in completing all requirements for the Ph.D.

Departmental Ph.D. Time Limits Policy

Pre-candidacy status, that is, the registered time before a student passes the qualifying examination and thereby advances to Ph.D. candidacy, may not exceed four years. Normative time for a Ph.D. in ethnic studies is six years. Normative time is defined as that period of time in which students under normal circumstances are expected to complete their doctoral program. To provide an incentive for students to complete the Ph.D. within normative time, students will only be eligible for departmental financial support for six years (eighteen quarters). By university policies, the doctoral dissertation must be submitted and defended within eight years. To meet this normative time limit, and to meet departmental requirements, students must complete the Qualifying Examination by the end of the fourth year.

In the spring quarter each year, the Graduate Program Committee will assess the progress of each pre-candidacy student on the basis of evaluations submitted by three faculty members chosen by the student. The committee will establish that the student is in good standing, recommend additional course work, or recommend dismissal. The committee may wish to meet with some students in person to discuss the student's evaluation and progress toward the degree.

COURSES

LOWER-DIVISION

1A. Introduction to Ethnic Studies: Population Histories of the United States (4)
This course examines the comparative historical demography of what is today the United States, focusing on the arrival, growth, distribution, and redistribution of immigrants from Asia, Europe, Africa, and Latin America.

1B. Introduction to Ethnic Studies: Immigration and Assimilation in American Life (4)
A history of immigration to the United States from colonial times to the present, with emphasis on the roles of ethnic and racial groups in economics, power relations between dominant and subordinate groups, and contemporary ethnic and racial consciousness.

1C. Introduction to Ethnic Studies: Race and Ethnic Relations in the United States (4)
This course examines the theoretical literature on race and ethnicity, focusing on issues of domination and subordination, and the historical emergence of racism and ethnic conflict. Attention is given to class and gender differences within racial and ethnic groups.

87. Freshman Seminar (1)
The Freshman Seminar Program is designed to provide new students with the opportunity to explore an intellectual topic with a faculty member in a small seminar setting. Freshman seminars are offered in all campus departments and undergraduate colleges, and topics vary from quarter to quarter. Enrollment is limited to 15 to 20 students, with preference given to entering freshmen.

90. Undergraduate Seminar (1)
A seminar intended for exposing undergraduate students, especially freshmen and sophomores, to exciting research programs conducted by department faculty. Enrollment is limited.

UPPER-DIVISION

Prerequisite: upper-division standing or consent of instructor.

100. Theories and Methods in Ethnic Studies (4)
An introduction to research in ethnic studies with special emphasis on theories, concepts, and methods. Students will explore how racial and ethnic categories are shaped by gender, class, and regional experiences and will study ethnicity and race in comparative perspective.

101. Ethnic Images in Film (4)
An upper-division lecture course studying representations of ethnicity in the American cinema. Topics include ethnic images as narrative devices, the social implications of ethnic images, and the role of film in shaping and reflecting societal power relations.

103. Environmental Racism (4)
This course will examine the concept of environmental racism, the empirical evidence of its widespread existence, and the efforts by government, residents, workers, and activists to combat it. We will examine those forces that create environmental injustices in order to understand its causes as well as its consequences. Students are expected to learn and apply several concepts and social scientific theories to the course material.

104. Race, Space, and Segregation (4)
Through in-depth studies of housing segregation, urban renewal and displacement, neighborhood race effects, and the location of hazards and amenities, this course examines how space becomes racialized and how race becomes spatialized in the contemporary U.S.

105. Ethnic Diversity and the City (4)
This course will examine the city as a crucible of ethnic identity exploring both the racial and ethnic dimensions of urban life in the U.S. from the Civil War to the present. (Cross-listed with USP 104.)

106. Ethnoracial Transformations of U.S. Communities (4)
Course examines the rapid growth of ethnic/racial minority populations in U.S. cities; how long-term residents respond to these ethnoracial transformations; how ethnic/racial groups are/are not being incorporated into American institutions; and implications of these transformations for the nation.

107. Field Work in Racial and Ethnic Communities (4)
This is a research course examining social, economic, and political issues in ethnic and racial communities through a variety of research methods which may include interviews, and archival, library, and historical research. (Cross-listed with USP 130.)

108. Race, Culture, and Social Change (4)
Aggrieved groups often generate cultural expressions by turning negative ascription into positive affirmation and by transforming segregation into congregation. This course examines the role of cultural expressions in struggles for social change by these communities inside and outside the U.S. (Cross-listed with MUS 151.)

109. Race and Social Movements (4)
This course explores collective mobilizations for resources, recognition, and power by members of aggrieved racialized groups, past and present. Emphasis will be placed on the conditions that generate collective movements, the strategies and ideologies that these movements have developed, and on the prospect for collective mobilization for change within aggrieved communities in the present and future.

110. Cultural World Views of Native Americans (4)
Using interdisciplinary methods, this course examines the cultural world views of various Native American societies in the United States through an exploration of written literary texts and other expressive cultural forms such as dance, art, song, religious and medicinal rituals.

111. Native American Literature (4)
This course analyzes Native American written and oral traditions. Students will read chronicles and commentaries on published texts, historic speeches, trickster narratives, oratorical and prophetic tribal epics, and will delve into the methodological problems posed by tribal literature in translation.

112A. History of Native Americans in the United States I (4)
This course examines the history of Native Americans in the United States, with emphasis on the lifeways, mores, warfare, cultural adaptation and relations with the European colonial powers and the emerging United States until 1870. (Cross-listed with HIUS 108A.)

112B. History of Native Americans in the United States II (4)
This course examines the history of Native Americans in the United States, with emphasis on the lifeways, mores, warfare, cultural adaptation and relations with the United States from 1870 to the present. (Cross-listed with HIUS 108B.)

116. The United States-Mexico Border in Comparative Perspective (4)
This course critically explores the U.S.-Mexico frontier and the social-cultural issues on both sides of the international demarcation. Social-historical and political-economic patterns illuminate border life, ethnic identity, social diversity, and cultural expression. Border ethnography is complemented by film and music.

117. Organic Social Movements (4)
Examination of local responses to global change and social disruption through the examination of organic movements in indigenous societies. In-depth analysis of the Kuna Indians of San Blas, Panama; Maya-Zapatistas of Chiapas, Mexico; and Micronesians of the western Pacific.

118. Contemporary Immigration Issues (4)
This course examines the diversity of today's immigrants—their social origins and contexts of exit and their adaptation experiences and contexts of incorporation.

119. Multiracial Societies in the Americas (4)
This course explores the genesis, evolution, and contradictions of racially heterogeneous societies in the Americas, from European conquest to the present. Topics: the social history of Indians, blacks, Asians, and their interactions with Europeans, and racial, sexual, and class divisions.

121. Contemporary Asian-American History (4)
The course will study changes in Asian-American communities as a result of renewed immigration since 1965; the influx of refugees from Vietnam, Kampuchea, and Laos; the impact of contemporary social movements on Asian-Americans' current economic, social, and political status.

122. Asian-American Culture and Identity (4)
A survey of Asian-American cultural expressions in literature, art, and music to understand the social experiences that helped forge Asian-American identity. Topics: culture conflict, media portrayals, assimilation pressures, the model minority myth, and interethnic and class relations.

123. Asian-American Politics (4)
This course will examine the development of Asian-American politics by studying the historical and contemporary factors, such as political and economic exclusion, that have contributed to the importance and complexity of ethnicity as a mobilizing force in politics.

124. Asian-American Literature (4)
Selected topics in the literature by men and women of Asian descent who live and write in the United States. May be repeated for credit when topics vary. (Cross-listed with LTEN 181.)

125. Asian-American History (4)
Explore how Asian Americans were involved in the political, economic and cultural formation of United States society. Topics include migration; labor systems; gender, sexuality and social organization; racial ideologies and anti-Asian movements; and nationalism and debates over citizenship. (Cross-listed with HIUS 124.)

127. Sexuality and Nation (4)
This course explores the nexus of sex, race, ethnicity, gender, and nation and considers their influence on identity, sexuality, migration, movement and borders, and other social, cultural, and political issues which these constructs affect. (Cross-listed with CGS 112.)

128. Hip Hop: The Politics of Culture (4)
Examination of hip hop's technology, lyrics, and dance and its influences in graffiti, film, music video, fiction, advertising, gender, corporate investment, government, and censorship with a critical focus on race, gender, and popular culture and the politics of creative expression. (Cross-listed with MUS 152.)

129. Asian and Latina Immigrant Workers in the Global Economy (4)
This course will explore the social, political, and economic implications of global economic restructuring, immigration policies, and welfare reform on Asian and Latina immigrant women in the United States. We will critically examine these larger social forces from the perspectives of Latina and Asian immigrant women workers, incorporating theories of race, class, and gender to provide a careful reading of the experiences of immigrant women on the global assembly line. (Cross-listed with USP 135.)

130. Social and Economic History of the Southwest I (4)
This course examines the history of the Spanish and Mexican Borderlands (what became the U.S. Southwest) from roughly 1400 to the end of the U.S.-Mexican war in 1848, focusing specifically on the area's social, cultural, and political development. (Cross-listed with HIUS 158.)

131. Social and Economic History of the Southwest II (4)
This course examines the history of the American Southwest from the U.S.-Mexican War in 1846-48 to the present, focusing on immigration, racial and ethnic conflict, and the growth of Chicano national identity. (Cross-listed with HIUS 159.)

132. Chicano Dramatic Literature (4)
Focusing on the contemporary evolution of Chicano dramatic literature, the course will analyze playwrights and theatre groups that express the Chicano experience in the United States, examining relevant actors, plays, and documentaries for their contributions to the developing Chicano theatre movement. (Cross-listed with THHS 110.)

133. Hispanic-American Dramatic Literature (4)
This course examines the plays of leading Cuban-American, Puerto Rican, and Chicano playwrights in an effort to understand the experiences of these Hispanic-American groups in the United States. (Cross-listed with THHS 111.)

134. Immigration and Ethnicity in Modern American Society (4)
Comparative study of immigration and ethnic-group formation in the United States from 1880 to the present. Topics include immigrant adaptation, competing theories about the experiences of different ethnic groups, and the persistence of ethnic attachments in modern American society. Requirements will vary for undergraduate, M.A., and Ph.D. students. Graduate students may be required to submit a more substantial piece of work. (Cross-listed with HIUS 180 and conjoined with HIUS 280.) *Prerequisites: upper-division standing and department stamp.*

135A. Early Latino/a-Chicano/a Cultural Production: 1848 to 1960 (4)
Cross-disciplinary study of nineteenth and early twentieth century Latino/a-Chicano/a literature, folklore,

The Doctoral Committee consists of five persons proposed by the student and accepted by the department chair and the office of Graduate Studies and Research according to graduate council regulations. A sixth member of the committee may be added with the approval of the department chair. Students are expected to select the chair of their examination committee by the winter quarter of the third year of study. The chair of the Ph.D. Examination Committee serves as the student's adviser for the remainder of the student's graduate program. Three of the Examination Committee members must be Department of Ethnic Studies faculty; the other two must be from other departments.

Fourteen days before the scheduled qualifying examination, the student must submit the written dissertation prospectus to the examination committee. On this same day, the student will receive from the chair of the examination committee a three-question written exam testing knowledge of the required graduate reading list. Seven days before the scheduled qualifying examination, the student must submit written answers to the questions that have been posed, distributing copies of these essays to all examination committee members. A two-hour oral examination will occur on the appointed date. At the two-hour oral exam, the student will answer questions posed by the committee about the student's dissertation prospectus, mastery of the required graduate reading list, answers to the written part of the exam, and comprehensive knowledge of ethnic studies scholarship. Based on written papers and on oral performance, three possible grades will be selected by the examination committee: No Pass, Pass, and High Pass. Students who receive a No Pass must retake the qualifying examination within one year and obtain a Pass grade to remain in the doctoral program.

The Doctoral Dissertation

Once students pass the qualifying exam, they may begin dissertation research. Students are expected to consult with their committee members on a regular basis during the research process.

All doctoral students will be evaluated annually by the doctoral committee and given a written report signed by the thesis adviser according to campus policy.

When the dissertation has been substantially completed and once committee members have had the opportunity to review drafts of the written work, the committee meets (with or without the student present at the discretion of the committee chair) to consider the progress made and to identify concerns, changes to be made, or further research to be done. Once the committee members are substantially satisfied with the written work, the student, in consultation with the committee, schedules the oral defense of the dissertation. By university regulation, the defense is open to the public.

The final version of the dissertation must be approved by each member of the doctoral committee. Having successfully defended the dissertation in oral examination, the student is eligible to receive the Ph.D. degree. The final version of the dissertation is then filed with the university librarian via the office of Graduate Studies and Research. Acceptance of the dissertation by the university librarian is the final step in completing all requirements for the Ph.D.

Departmental Ph.D. Time Limits Policy

Pre-candidacy status, that is, the registered time before a student passes the qualifying examination and thereby advances to Ph.D. candidacy, may not exceed four years. Normative time for a Ph.D. in ethnic studies is six years. Normative time is defined as that period of time in which students under normal circumstances are expected to complete their doctoral program. To provide an incentive for students to complete the Ph.D. within normative time, students will only be eligible for departmental financial support for six years (eighteen quarters). By university policies, the doctoral dissertation must be submitted and defended within eight years. To meet this normative time limit, and to meet departmental requirements, students must complete the Qualifying Examination by the end of the fourth year.

In the spring quarter each year, the Graduate Program Committee will assess the progress of each pre-candidacy student on the basis of evaluations submitted by three faculty members chosen by the student. The committee will establish that the student is in good standing, recommend additional course work, or recommend dismissal. The committee may wish to meet with some students in person to discuss the student's evaluation and progress toward the degree.

COURSES

LOWER-DIVISION

1A. Introduction to Ethnic Studies: Population Histories of the United States (4)
This course examines the comparative historical demography of what is today the United States, focusing on the arrival, growth, distribution, and redistribution of immigrants from Asia, Europe, Africa, and Latin America.

1B. Introduction to Ethnic Studies: Immigration and Assimilation in American Life (4)
A history of immigration to the United States from colonial times to the present, with emphasis on the roles of ethnic and racial groups in economics, power relations between dominant and subordinate groups, and contemporary ethnic and racial consciousness.

1C. Introduction to Ethnic Studies: Race and Ethnic Relations in the United States (4)
This course examines the theoretical literature on race and ethnicity, focusing on issues of domination and subordination, and the historical emergence of racism and ethnic conflict. Attention is given to class and gender differences within racial and ethnic groups.

87. Freshman Seminar (1)
The Freshman Seminar Program is designed to provide new students with the opportunity to explore an intellectual topic with a faculty member in a small seminar setting. Freshman seminars are offered in all campus departments and undergraduate colleges, and topics vary from quarter to quarter. Enrollment is limited to 15 to 20 students, with preference given to entering freshmen.

90. Undergraduate Seminar (1)
A seminar intended for exposing undergraduate students, especially freshmen and sophomores, to exciting research programs conducted by department faculty. Enrollment is limited.

UPPER-DIVISION

Prerequisite: upper-division standing or consent of instructor.

100. Theories and Methods in Ethnic Studies (4)
An introduction to research in ethnic studies with special emphasis on theories, concepts, and methods. Students will explore how racial and ethnic categories are shaped by gender, class, and regional experiences and will study ethnicity and race in comparative perspective.

101. Ethnic Images in Film (4)
An upper-division lecture course studying representations of ethnicity in the American cinema. Topics include ethnic images as narrative devices, the social implications of ethnic images, and the role of film in shaping and reflecting societal power relations.

103. Environmental Racism (4)
This course will examine the concept of environmental racism, the empirical evidence of its widespread existence, and the efforts by government, residents, workers, and activists to combat it. We will examine those forces that create environmental injustices in order to understand its causes as well as its consequences. Students are expected to learn and apply several concepts and social scientific theories to the course material.

104. Race, Space, and Segregation (4)
Through in-depth studies of housing segregation, urban renewal and displacement, neighborhood race effects, and the location of hazards and amenities, this course examines how space becomes racialized and how race becomes spatialized in the contemporary U.S.

105. Ethnic Diversity and the City (4)
This course will examine the city as a crucible of ethnic identity exploring both the racial and ethnic dimensions of urban life in the U.S. from the Civil War to the present. (Cross-listed with USP 104.)

106. Ethnoracial Transformations of U.S. Communities (4)
Course examines the rapid growth of ethnic/racial minority populations in U.S. cities; how long-term residents respond to these ethnoracial transformations; how ethnic/racial groups are/are not being incorporated into American institutions; and implications of these transformations for the nation.

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This course examines the history of Native Americans in the United States, with emphasis on the lifeways, mores, warfare, cultural adaptation and relations with the European colonial powers and the emerging United States until 1870. (Cross-listed with HIUS 108A.)

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This course examines the history of Native Americans in the United States, with emphasis on the lifeways, mores, warfare, cultural adaptation and relations with the United States from 1870 to the present. (Cross-listed with HIUS 108B.)

116. The United States-Mexico Border in Comparative Perspective (4)
This course critically explores the U.S.-Mexico frontier and the social-cultural issues on both sides of the international demarcation. Social-historical and political-economic patterns illuminate border life, ethnic identity, social diversity, and cultural expression. Border ethnography is complemented by film and music.

117. Organic Social Movements (4)
Examination of local responses to global change and social disruption through the examination of organic movements in indigenous societies. In-depth analysis of the Kuna Indians of San Blas, Panama; Maya-Zapatistas of Chiapas, Mexico; and Micronesians of the western Pacific.

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This course will examine the development of Asian-American politics by studying the historical and contemporary factors, such as political and economic exclusion, that have contributed to the importance and complexity of ethnicity as a mobilizing force in politics.

124. Asian-American Literature (4)
Selected topics in the literature by men and women of Asian descent who live and write in the United States. May be repeated for credit when topics vary. (Cross-listed with LTEN 181.)

125. Asian-American History (4)
Explore how Asian Americans were involved in the political, economic and cultural formation of United States society. Topics include migration; labor systems; gender, sexuality and social organization; racial ideologies and anti-Asian movements; and nationalism and debates over citizenship. (Cross-listed with HIUS 124.)

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Examination of hip hop's technology, lyrics, and dance and its influences in graffiti, film, music video, fiction, advertising, gender, corporate investment, government, and censorship with a critical focus on race, gender, and popular culture and the politics of creative expression. (Cross-listed with MUS 152.)

129. Asian and Latina Immigrant Workers in the Global Economy (4)
This course will explore the social, political, and economic implications of global economic restructuring, immigration policies, and welfare reform on Asian and Latina immigrant women in the United States. We will critically examine these larger social forces from the perspectives of Latina and Asian immigrant women workers, incorporating theories of race, class, and gender to provide a careful reading of the experiences of immigrant women on the global assembly line. (Cross-listed with USP 135.)

130. Social and Economic History of the Southwest I (4)
This course examines the history of the Spanish and Mexican Borderlands (what became the U.S. Southwest) from roughly 1400 to the end of the U.S.-Mexican war in 1848, focusing specifically on the area's social, cultural, and political development. (Cross-listed with HIUS 158.)

131. Social and Economic History of the Southwest II (4)
This course examines the history of the American Southwest from the U.S.-Mexican War in 1846-48 to the present, focusing on immigration, racial and ethnic conflict, and the growth of Chicano national identity. (Cross-listed with HIUS 159.)

132. Chicano Dramatic Literature (4)
Focusing on the contemporary evolution of Chicano dramatic literature, the course will analyze playwrights and theatre groups that express the Chicano experience in the United States, examining relevant actors, plays, and documentaries for their contributions to the developing Chicano theatre movement. (Cross-listed with THHS 110.)

133. Hispanic-American Dramatic Literature (4)
This course examines the plays of leading Cuban-American, Puerto Rican, and Chicano playwrights in an effort to understand the experiences of these Hispanic-American groups in the United States. (Cross-listed with THHS 111.)

134. Immigration and Ethnicity in Modern American Society (4)
Comparative study of immigration and ethnic-group formation in the United States from 1880 to the present. Topics include immigrant adaptation, competing theories about the experiences of different ethnic groups, and the persistence of ethnic attachments in modern American society. Requirements will vary for undergraduate, M.A., and Ph.D. students. Graduate students may be required to submit a more substantial piece of work. (Cross-listed with HIUS 180 and conjoined with HIUS 280.) *Prerequisites: upper-division standing and department stamp.*

135A. Early Latino/a-Chicano/a Cultural Production: 1848 to 1960 (4)
Cross-disciplinary study of nineteenth and early twentieth century Latino/a-Chicano/a literature, folklore,

music, testimonio, or other cultural practices. Specific periods covered will fall between the immediate aftermath of the Treaty of Guadalupe Hidalgo to the Cuban revolution. Repeatable for credit when topics vary. (Cross-listed with LTSP 150A.) *Prerequisites: LTSP 50B or consent of instructor.*

135B. Contemporary Latino/a-Chicano/a Cultural Production: 1960 to Present (4)
Cross-disciplinary study of late twentieth century Latino/a-Chicano/a literature, the visual and performing arts, film, or other cultural practices. Specific periods covered will fall between the Kennedy years to the era of neoliberalism and the creation of "Hispanic" or Latino/a identities. Repeatable for credit when topics vary. (Cross-listed with LTSP 150B.) *Prerequisites: LTSP 50B or consent of instructor.*

136. Topics in Chicano/a-Latino/a Cultures (4)
Cross-disciplinary study of late twentieth century Latino/a-Chicano/a literature, the visual and performing arts, film, or other cultural practices. Representative areas of study are social movements, revolution, immigration, globalization, gender and sexuality, cultures of the U.S.-Mexican border, and Chicano/a-Mexicano/a literary relations. Repeatable for a credit when topics vary. (Cross-listed with LTSP 151.) *Prerequisites: LTSP 50B or consent of instructor.*

138. Chicano/a and Latino/a Poetry (4)
A study of themes and issues in the poetic production of Latino communities in the United States. Every effort will be made to select text in Spanish but some will be bilingual. Repeatable for credits when topics vary. (Cross-listed with LTSP 153.) *Prerequisites: LTSP 50B or consent of instructor.*

139. Chicano Literature in English (4)
Introduction to the literature in English by the Chicano population, the men and women of Mexican descent who live and write in the United States. The primary focus is the contemporary period. (Cross-listed with LTEN 180.)

140. Language and American Ethnicity (4)
This course examines the intersection of language and ethnicity in the United States, focusing on the social and political impact of bilingualism, ethnically based English dialects, and standard and nonstandard English.

141. Language, Culture, and Inequality (4)
A critical review of conceptions of language and how they have been deployed in constructing images of culture, race, ethnicity, gender, sexuality, and class. Topics include cultural and linguistic relativism, structuralism, symbolic and cognitive approaches, ethnomethodology, sociolinguistics, ethnography of speaking, performance, and ethnopoetics.

142. Medicine, Race, and the Global Politics of Inequality (4)
Globalization fosters both the transmission of AIDS, cholera, tuberculosis, and other infectious diseases and gross inequalities in the resources available to prevent and cure them. This course focuses on how race, ethnicity, gender, sexuality, class, and nation both shape and are shaped by the social construction of health and disease worldwide.

144. Bilingual Communities in the U.S.A. (4)
This course compares the many ways of "doing being bilingual" that exist among communities of speakers of varied national origins, generations, networks, localities, races, classes, and genders. Of particular interest are the varied types of bilingual individuals and linguistic repertoires that exist in communities of Native American, Chicano/Latino, and Asian origin, and the implications of shifting and hybrid linguistic identities for the drawing of community boundaries and the shaping of national language policy. Specific topics include factors that promote language loss or maintenance in families, the linguistic and cultural repercussions of code switching and word borrowing, bilingual education, linguistic profiling, and language ideologies.

145. Spanish Language in the United States (4)
A sociolinguistic study of the popular dialects in the United States and their relation to other Latin American dialects. The course will cover phonological and syntactic differences between the dialects as well as the influence of English on the Southwest dialects. (Cross-listed with LTSP 162.)

146A. Theatrical Ensemble (4-4)
An intensive theatre practicum designed to generate theatre created by an ensemble, with particular emphasis upon the analysis of text. Students will explore and analyze scripts and authors. Ensemble segments include: black theatre, Chicano theatre, feminist theatre, commedia dell'arte theatre. (Cross-listed with THAC 120.)

148. Latino/a and Chicano/a Literature (4)
This course will study the representation of a variety of social issues (immigration, racism, class differences, violence, inter/intra-ethnic relations, etc.) in works written in Spanish by Latino/a and Chicano/a writers. May be repeated for credit as topics, texts, and historical periods vary. (Cross-listed with LTSP 154.) *Prerequisites: LTSP 50B or consent of instructor.*

149. African American History in the Twentieth Century (4)
This course examines the transformation of African America across the expanse of the long twentieth century: imperialism, migration, urbanization, desegregation, and deindustrialization. Special emphasis will be placed on issues of culture, international relations, and urban politics. (Cross-listed with HIUS 139.)

150. Politics of Cultural Pluralism and National Integration (4)
This course comparatively analyzes the problems posed by subnational loyalties founded on ethnic, linguistic, racial, religious, and caste identities in Asia, Africa, Europe, and the Western Hemisphere. Particular attention will be given to the processes of national integration in multicultural politics.

151. Ethnic Politics in America (4)
This course will survey the political effects of immigration, ethnic mobilization, and community building in America, and the contemporary role of ethnicity in politics and intergroup relations.

152. Law and Civil Rights (4)
In this course students explore the relationship between race, class, and law as it applies to civil rights both in an historical and a contemporary context. Topics include racism and the law, history of the 14th Amendment, equal protection, school desegregation, and affirmative action.

159. Topics in African American History (4)
A colloquium dealing with special topics in the history of people of African descent in the United States. Themes will vary from quarter to quarter. Requirements will vary for undergraduate, M.A., and Ph.D. students. Graduate students will be required to submit a more substantial piece of work. (Cross-listed with HIUS 183 and conjoined with HIUS 283.)

160. Black Politics and Protest 1885–1941 (4)
An examination of the evolution of black thought and activism from Booker T. Washington's Atlanta Exposition Address to A. Philip Randolph's March on Washington Movement. Particular attention paid to black institutions and their relationship to the federal government.

161. Black Politics and Protest Since 1941 (4)
Discussion of black social, political, and intellectual experiences since the publication of Richard Wright's *Native Son*. Close examination of blacks' involvement in and relationships to Second World War, Cold War, Civil Rights Movement, Black Power Movement, Reagan Revolution, and Underclass Debate.

162. Cultural Contact and Exchange (4)
An examination of the comparative histories of cultural contact and exchange between indigenous peoples and "outsiders." Particular attention will be paid to the way in which social hierarchy and cultural belief systems guide the balance of power between dissimilar societies.

163. Leisure in Urban America (4)
Historical examination of how leisure has shaped the American urban landscape. Course will explore connections between spectator sports and the rise of "urban mentalities"; sports franchises, urban redevelopment schemes, and racial and ethnic communities; and sports mythology and civil pride.

164. African Americans and the Mass Media (4)
Examination of the media representations of African Americans from slavery to the present focusing on emergence and transmission of enduring stereotypes, their relationship to changing social, political, and economic frameworks, and African Americans' responses to and interpretations of these mediated images. (Cross-listed with MUS 153.)

165. Sex and Gender in African American Communities (4)
This course will investigate the changing constructions of sex, gender, and sexuality in African American communities defined by historical period, region, and class. Topics will include the sexual division of labor, myths of black sexuality, the rise of black feminism, black masculinity, and queer politics.

166. The Black Press and Social Change (4)
An investigation of the black press—including newspapers, periodicals, and electronic media—as agents for social change in African American history. The course will consider the changing cultural and political functions of the black press, economic forces, and the work of influential journalists, artists, and intellectuals.

167. African-American History in War and Peace: 1917 to the Present (4)
The social, political, economic, and ideological pressures generated during the international conflicts of the twentieth century have had an enormous impact on American life. This course examines how the pressures of "total war" and "cold war" shaped the African-American experience in both war and peacetime. (Cross-listed with HIUS 138)

168. Comparative Ethnic Literature (4)
A lecture-discussion course that juxtaposes the experience of two or more U.S. ethnic groups and examines their relationship with the dominant culture. Students will analyze a variety of texts representing the history of ethnicity in this country. Topics will vary. (Cross-listed with LTEN 178.)

170A. Origins of the Atlantic World, c. 1450–1650 (4)
An examination of interactions among the peoples of western Europe, Africa, and the Americas that transformed the Atlantic basin into an interconnected "Atlantic World." Topics will include maritime technology and the European Age of Discovery, colonization in the Americas, the beginnings of the transatlantic slave trade, and early development of plantation slavery in the New World. (Cross-listed with HIUS 135A.)

170B. Slavery and the Atlantic World (4)
The development of the Atlantic slave trade and the spread of racial slavery in the Americas before 1800. Explores the diversity of slave labor in the Americas and the different slave cultures African Americans produced under the constraints of slavery. (Cross-listed with HIUS 135B.)

172. Afro-American Prose (4)
Students will analyze and discuss the novel, the personal narrative, and other prose genres, with particular emphasis on the developing characters of Afro-American narrative and the cultural and social circumstances that influence their development. (Cross-listed with LTEN 183.)

173. Afro-American Poetry (4)
A close reading and analysis of selected works of Afro-American poetry as they reflect styles and themes that recur in the literature. (Cross-listed with LTEN 184.)

174. Themes in Afro-American Literature (4)
This course focuses on the influence of slavery upon African American writers. Our concern is not upon what slavery was but upon what it is within the works and what these texts reveal about themselves, their authors, and their audiences. (Cross-listed with LTEN 185.)

175. Literature of the Harlem Renaissance (4)
The Harlem Renaissance (1917–39) focuses on the emergence of the "New Negro" and the impact of this concept on black literature, art, and music. Writers studied include Claude McKay, Zora N. Hurston, and Langston Hughes. Special emphasis on new themes and forms. (Cross-listed with LTEN 186.)

176. Black Music/Black Texts: Communication and Cultural Expression (4)
Explores role of music as a traditional form of communication among Africans, Afro-Americans, and West Indians. Special attention given to poetry of black music, including blues and other forms of vocal music expressive of contestatory political attitudes. (Cross-listed with LTEN 187 and MUS 154.)

178. Blues: An Oral Tradition (4)
This course will examine the development of the Blues from its roots in work-songs and the minstrel show to its flowering in the Mississippi Delta to the development of Urban blues and the close relationship of the Blues with Jazz, Rhythm and Blues, and Rock and Roll. (Cross-listed with MUS 126.)

179A. Jazz Roots and Early Development (1900–1943) (4)
This course will trace the early development of Jazz and the diverse traditions which helped create this uniquely American art form. We will witness the emergence of Louis Armstrong in New Orleans and examine the composer's role in Jazz with Jelly Roll Morton and Duke Ellington. (Cross-listed with MUS 127A.)

179B. Jazz Since 1946: Freedom and Form (4)
This course will examine the evolution of Jazz from 1943 to the present. The course will survey the contrasting and competing styles in Jazz from BEBOP to COOL to the avant garde and fusion. (Cross-listed with MUS 127B.)

Colloquia

180. Topics in Mexican-American History (4)
This colloquium studies the racial representation of Mexican-Americans in the United States from the nineteenth century to the present, examining critically the theories and methods of the humanities and social sciences. (Cross-listed with HIUS 167.)

181. Topics in the Comparative History of Modern Slavery (4)
Slavery was both a thread of continuity in the history of the Americas and distinctive institution in the specific social settings. The purpose of this course is to examine and discuss readings that explore topics in the Caribbean and the U.S. Because topics will vary, the seminar may be taken more than once for credit, with permission of the instructor. Requirements vary for undergraduates, M.A., and Ph.D. students. Graduate students are required to submit a more substantial piece of work. (Cross-listed with HIUS 164 and conjoined with HIUS 264.)

182. Segregation, Freedom Movements, and the Crisis of the Twentieth Century (4)
A reading and discussion seminar that views the origins of segregation and the social movements that challenged it between 1890 and 1970 in a comparative framework. (Cross-listed with HIUS 165.)

183. Gender, Race, Ethnicity, and Class (4)
Gender is often neglected in studies of ethnic/racial politics. This seminar explores the relationship of race, ethnicity, class, and gender by examining the participation of working class women of color in community politics and how they challenge mainstream political theory.

184. Black Intellectuals in the Twentieth Century (4)
An analysis of black cultural and intellectual production since 1895. Course will explore how race and race-consciousness have influenced the dialogue between ideas and social experience; and how other factors—i.e., age, gender, and class—affected scholars' insights.

185. Discourse, Power, and Inequality (4)
While discourse analysis has transformed numerous disciplines, a gap separates perspectives that envision discourse as practices that construct inequality from approaches which treat discourse as everyday language. This course engages both perspectives critically in analyzing law, medicine, and popular culture.

186. The Ethnic Press in the United States (4)
Readings and research on news media institutions established in ethnic communities since the nineteenth century. The course will trace the emergence, development, and longevity of ethnic presses, their role in cultivating and maintaining ethnic identity, and their attempts to respond to and resist images in mainstream media.

187. Black Nationalism (4)
This course will investigate the ideologies and practices of black nationalist movements in the United States and/or across the black Diaspora, focusing on their political philosophy, political culture, and gender and class structure.

188. African Americans, Religion, and the City (4)
This course details the history of African American migration to urban areas after World War I and World War II and explores the role of religion in their lives as well as the impact that their religious experiences had upon the cities in which they lived. (Cross-listed with USP 132.)

189. Special Topics in Ethnic Studies (4)
A reading and discussion course that explores special topics in ethnic studies. Themes will vary from quarter to quarter; therefore, course may be repeated for credit.

Seminars and Independent Studies

190. Research Methods: Studying Racial and Ethnic Communities (4)
The course offers students the basic research methods with which to study ethnic and racial communities. The various topics to be explored include human and physical geography, transportation, employment, economic structure, cultural values, housing, health, education, and intergroup relations.

191. Undergraduate Research in Ethnic Studies (4)
This course is designed to help students conduct their own research rather than merely read the research of others. The course will introduce students to research paradigms in ethnic studies, familiarize them with finding aids and other library resources, and involve them in the design of research plans. *Prerequisite: instructor approval.*

192. Honors Research in Ethnic Studies (4)
This course is a continuation of Ethnic Studies 191 Undergraduate Research in Ethnic Studies. Students who have completed ETHN 191 and selected a faculty research adviser may enroll in this course. During the quarter the research for the honors project will be completed under the faculty adviser's supervision. Faculty advisers will meet weekly with their honors students to oversee the progress made in carrying out the plan of research. *Prerequisite: completion of 191.*

193. Honors Research in Ethnic Studies (4)
This course is a continuation of Ethnic Studies 192 Honors Research in Ethnic Studies. Students who have completed ETHN 192 and are continuing to work with a faculty research adviser may enroll in this course. During the quarter the written drafts and final honors paper will be completed under the faculty adviser's supervision. The student will meet weekly with the faculty adviser in order to prepare drafts and the final version of the honors paper. *Prerequisite: insructor approval.*

197. Fieldwork in Racial and Ethnic Communities (4)
This course comprises supervised community fieldwork on topics of importance to racial and ethnic communities in the greater San Diego area. Regular individual meetings with faculty sponsor and written reports are required. (May be repeated for credit.)

198. Directed Group Studies (4)
Directed group study on a topic or in a field not included in the regular department curriculum by special arrangement with a faculty member. (May be repeated for credit.)

199. Supervised Independent Study and Research (4)
Individual research on a topic that leads to the writing of a major paper. (May be repeated for credit.)

GRADUATE

200A. History of Ethnic Studies (4)
This course charts the origins of ethnic studies research, the emergence of dominant paradigms, and the history of race and ethnic issues across and within disciplines.

200B. Theories of Ethnic Studies (4)
A critical exploration of the ways in which theories of ethnic studies have constituted as well as analyzed knowledge and ethnic identity.

200C. Controversies in Ethnic Studies (4)
This course is structured around contemporary events and debates over theories, methods, and objects of inquiry in ethnic studies.

210. Research Seminar in Ethnic Studies (4)
This course introduces students to the practice of original discovery research in the field of racial and ethnic studies, including articulating a research problem, placing it within theoretical discussions, selecting appropriate methods, and analyzing data.

230. Departmental Colloquium (1)
This course is a forum for the presentation of recent research by guests, faculty, and students. This course may be repeated three times for credit.

240. Multidiciplinary Research Methods in Ethnic Studies (4)
A critical introduction to the broad range of methods used in ethnic studies research and how they have shaped social constructions of race, ethnicity, gender, class, and sexuality.

241A. Community Ethnography I: Method and Theory (4)
This course reviews the major tenets of ethnography using case studies of ethnographic work and critical theory pertaining to epistemological concerns in the social sciences. Critical here are the major ethical parameters of conducting ethnography in ethnic communities, the role of researchers, and the practical implications of such research.

241B. Community Ethnography II: Practicum (4)
This course focuses on the practical application of ethnographic concepts and methods in actual field research in a local San Diego community. The purpose here is to provide experience in conducting ethnography through participant observation, interviews, and contributing to communities. This will include a brief overview of ethnographic method, but will focus on hands-on research, analysis, and ethnographic writing.

250. Panethnicity in the United States (4)
This course compares and contrasts the experiences of the major panethnic groups in the United States, paying particular attention to the construction of ethnicity within contexts of power.

251. Cultural Pluralism and National Integration (4)
This course explores the ways in which nations and states around the world have imagined and managed the linguistic, racial, and religious differences of their citizens.

252. Ethnic Leadership in Comparative Perspective (4)
Readings and discussion on political and intellectual leadership in racial and ethnic communities. A critical focus will be placed on the tensions underlying leadership formation.

253. Mass Media and Ethnic Identity (4)
This course examines the ways that ethnic identity influences the practices of mass media, and the ways in which mass media shape and reflect ethnic identity.

254. Race and Racism (4)
This course examines inequality based on race with a focus on the institutions, symbols, and social practices which structure and maintain racism. Particular attention is given to laws and social policy which reinforce racial inequality.

255. Diaspora, Migration, and Return in the Post-Fordist Age (4)
This course studies the relationship between the transnational economy, new technologies, and mass migration in the contemporary world.

256. Gender, Sexuality, and Race (4)
This course studies the body cross-culturally as a site for the construction of gender, sex, ethnic, and racial identities.

257A-B. Social Theory (4-4)
An intensive survey of social and cultural theory, focusing on how constructions of science, language, politics, and social inequality shaped early modernity, Romantic Nationalism, Marxism, cultural relativity, psychoanalysis, and *fin de siècle* social thought. The second quarter surveys poststructuralist, postmodern, feminist, Subaltern Studies, globalization, and other critiques. ETHN 257A is not a prerequisite for ETHN 257B.

258. Ethnic Conflict and Cooperation (4)
This course critically examines theories and research on racial and ethnic relations. In particular, it will address how such relations are linked to, and emerge from, everyday activities and structural factors.

259. Comparative Conquests, Colonization, and Resistance in the Americas (4)
This course will offer a comparative survey of the impact of European interactions with Native nations and populations in the New World, from Peru to Canada. Readings will emphasize modes of initial interaction, patterns of European colonization, and Native adaptation and resistance, and broader changes in Native culture and cosmology as a result of conquest and colonization.

260. Transnationalism and Borderlands: The Local and Global (4)
This course critically reviews the analytical frameworks of transnationalism and borderlands. The goals are to assess traditional and current social science practice on immigration, identity, and community studies, and to understand how diverse peoples engage and participate in global processes.

261. Race and Law (4)
This seminar advances a critique of law's innocence—of its claims for universality. The reading of legal and scientific texts will indicate how by incorporation existing constructions of the meanings of race, the law produces racialized modern subjects.

262. Race, Inequality, and Health (4)
New critical and multidisciplinary perspectives provide tools for examining entrenched and newly emerging diseases and inequalities. This course examines medicine and public health in relationship to race, gender, sexuality, class, and nation and explores how these connections affect the distribution of health and health services locally, nationally, and internationally.

289. Topics in Ethnic Studies Research (4)
This course is a research seminar on themes of contemporary and historic importance in ethnic studies. Themes will be determined by instructor. Course may be repeated three times for credit.

290A-B. Master's Thesis Preparation (4-4)
All graduate students are required to write a master's thesis as part of the requirements for the master of arts in ethnic studies. Students should enroll in the thesis preparation courses in the fall and spring quarters of the second year of graduate studies.

298. Directed Reading (1-12)
This is an independent research or individual guided tutorial in an area not covered by present course offerings. This course may be repeated for an indefinite number of times due to the independent nature of the content of the course.

299. Thesis Research (1-12)
Open to graduate students conducting doctoral thesis research. This course may be repeated for an indefinite number of times due to the independent nature of thesis research and writing.

500. Apprentice Teaching in Ethnic Studies (4)
A course in which teaching assistants are aided in learning proper teaching methods by means of supervision of their work by the faculty: handling of discussions, preparation and grading of examinations and other written exercises, and student relations.

Film Studies

OFFICE: 2073 Humanities and Social Sciences Building, Muir College
(858) 534-3589
http://muir.ucsd.edu/instructional/film-studies/index.html

Acting Director

Susan Kirkpatrick, Ph.D.

Professors

Alain J.-J. Cohen, Ph.D., *Literature*
Stephen D. Cox, Ph.D., *Literature*
R. Michael Davidson, Ph.D., *Literature*
Judith Halberstam, Ph.D., *Literature*
Allan Havis, M.F.A., *Theatre*
Walton Jones, M.F.A., *Theatre*
Bennetta Jules-Rosette, Ph.D., *Sociology*
Marianne McDonald, Ph.D., *Theatre*
Paul Pickowicz, Ph.D., *History*
Lesley Stern, Ph.D., *Visual Arts*
Yingin Zhang, Ph.D. *Literature*

Associate Professors

Steven Adler, M.F.A., *Theatre*
Robert Cancel, Ph.D., *Literature*
James Carmody, Ph.D., *Theatre*
Elizabeth Cartwright, Ph.D., *Communication*
Cynthia Walk, Ph.D., *Literature*
Winifred Woodhull, Ph.D., *Literature*

Assistant Professors

Giovanna Chesler, M.F.A., *Communication*
Brian Goldfarb, Ph.D., *Communication*

Senior Lecturer with Security of Employment

Ursula Meyer, M.F.A., *Theatre*

The Minor

In the course of the twentieth century film in all its applications—as storytelling, as documentary, as propaganda, as popular entertainment—became a powerful social and cultural force on an international scale. The importance of film is reflected in the number of faculty at UCSD whose scholarship and teaching involves film and in the number of courses regularly offered which focus on some aspect of film studies and which use film as an essential component of the course material. The Film Studies minor is designed to give students a flexible introduction to the full range of courses on film available here. As noted below, the only constraints are that five of the seven courses must be in the upper division and that the seven courses must come from at least two different departments. This latter requirement is designed to insure some level of breath in the minor. The minor should be of interest to students with a wide range of interests from those who plan graduate study in film to those who simply wish to understand better this powerful and influential medium.

REQUIREMENTS

Seven courses, at least five of which must be upper-division, from the following list. The seven courses must be drawn from at least two different departments.

COURSES

COCU 110. Cinema in Latin America (4)

COCU 125. How to Read a Film (4)

COCU 132 Gender and Media (4)

COHI 143. The Psychology of the Filmic Text (4)

COSF 186. Film Industry (4)

ETHN 101. Ethnic Images in Film (4)

HIEA 133. Twentieth-Century China: Cultural History (4)

HIUS 122. History and Hollywood: America and the Movies since the Great Depression (4)

LTWL 4A-B-C-D-E-M. Fiction and Film in Twentieth-Century Societies (4-4-4-4-4-4)

LTAF 120. Literature and Film of Modern Africa (4)

LTEA 120A. Chinese Films (4)

LTEA 120B. Taiwan Films (4)

LTEA 120C. Hong Kong Films (4)

LTEA 120D. Filming Chinese Literature (4)

LTEU 159. Russian and Soviet Film (4)

LTWL 180. Film Studies and Literature: Film History (4)

LTWL 181. Film Studies and Literature: Film Movement (4)

LTWL 182. Film Studies and Literature: Film Genre (4)

LTWL 183. Film Studies and Literature: Director's Work (4)

LTWL 184. Film Studies and Literature: Close Analysis of Filmic Text (4)

LTWL 185. Film Studies and Literature: Interdisciplinary Issues (4)

LTWL 186. The Psychology of the Filmic Text (4)

PHIL 176. Film Aesthetics (4)

SOCA 105. Ethnographic Film: Media Methods (4)

SOCB 172. Films and Society (4)

SOCD 187. African Societies through Film (4)

THGE 10. Theatre and Film (4)

THGE 11. Great Performances on Film (4)

THGE 27. User-Friendly Shakespeare (4)

THGE 123. Mary Poppins Meets Bladerunner (4)

THGE 124. Cult Films: Weirdly Dramatic (4)

THHS 116. Old Myths in New Films (4)

THPW 104. Screenwriting (4)

VIS 84. History of Film (4)

VIS 150. History and Art of the Silent Cinema (4)

VIS 151. History of the Experimental Film (4)

VIS 152. Film in Social Context (4)

VIS 153. The Genre Series (4)

VIS 154. Hard Look at the Movies (4)

VIS 155. The Director Series (4)

VIS 156N. Special Problems in Film History and Theory (4)

VIS 194. Fantasy in Film (4)

Freshman Seminars

Office of the Senior Vice Chancellor—Academic Affairs
Mark Appelbaum, Associate Vice Chancellor—Undergraduate Education
OFFICE: University Center, Room 104
(858) 822-5855
http://academicaffairs.ucsd.edu/freshmanseminars.html

Freshman Seminars are designed to provide new students with the opportunity to explore an intellectual topic with a faculty member in a small seminar setting. Freshman seminars are offered in all campus departments, in many undergraduate colleges and academic programs, the Scripps Institution of Oceanography, and The Graduate School of International Relations and Pacific Studies. Topics vary from quarter to quarter. Enrollment is limited to twenty students, with preference given to entering freshmen. Freshman Seminars are specially designated by courses that are numbered 87, e.g., Phys. 87.

Questions about a specific Freshman Seminar should be directed to the department offering the seminar.

German Studies

OFFICE: 3024 Humanities and Social Sciences Building, Muir College (CAESAR Office)
(858) 534-3210
http://germanstudies.ucsd.edu
germanstudies@ucsd.edu

Program Director

Cynthia Walk, *Associate Professor, Literature*

Faculty

Frank Biess, *Assistant Professor, History*
Elizabeth Bredeck, *Lecturer, Literature*
William M. Chandler, *Professor, Political Science*
Harvey S. Goldman, *Professor, Sociology*
Michael O. Hardimon, *Associate Professor, Philosophy*
Todd C. Kontje, *Professor, Literature*
David S. Luft , *Professor, History*
Wayne M. Martin, *Associate Professor, Philosophy*
William A. O'Brien, *Associate Professor, Literature*
Frederick A. Olafson, *Professor Emeritus, Philosophy*
Carol Plantamura, *Professor, Music*
John Rouse, *Associate Professor, Theatre and Dance*
Anne Seshadri, *Lecturer, Music*
Jane Stevens, *Associate Professor, Music*
Tracy B. Strong, *Professor, Political Science*
Eric Watkins, *Associate Professor, Philosophy*

Program Description

German Studies is an interdisciplinary program that offers both a major and a minor for students with broad academic interests in the German-speaking world.

In consultation with a faculty adviser in the program, students design individual plans of study from the many core courses offered in the Departments of History, Literature, Music, Philosophy, Political Science, Sociology, and Theatre and Dance. Further courses, including some offered by other departments, may be incorporated into the student's program, if they

bear directly on German studies. Students considering a major or minor should consult a member of the German Studies faculty as early as possible.

Students need to attain competence in German (two years of university-level language courses or the equivalent) *before* they can take certain required upper-division courses. It is recommended that students attain this level of competence early in the program.

Study Abroad

All German Studies students are strongly encouraged to make overseas study an integral part of their program. The UC Education Abroad Program (EAP) conducts formal programs of study in Berlin, Gπttingen, and Bayreuth ranging from one-quarter, intensive beginning language programs to a full year of study at a German university. In addition, Eleanor Roosevelt College administers a full-year exchange program with Augsburg University. Students may petition to use up to five courses completed while studying abroad in their major, and three in their minor.

Senior Honors Thesis

At the beginning of his or her senior year, a student major in German Studies may elect to write a Senior Honor's Thesis. To be eligible, the student must have a GPA of 3.5 in the German Studies major at the beginning of the senior year.

To begin work, the student forms a committee of three appropriate faculty members, including a committee chair, who is chosen from among the German Studies Core Faculty. The chair supervises the student in a two-quarter program of independent study to research and write an Honor's Thesis of approximately thirty to fifty pages (GMST 196A/B; the two courses count among the required twelve for the major). The student defends the thesis in a one-hour oral exam with the full committee, which is charged with recommending the degree of honors that will appear on the student's transcript and diploma.

The Major

The major in German Studies requires twelve upper-division courses chosen from the core course list, and includes:

German Studies 100 and 101
(Literature Department)

three courses in German Literature

two courses in History

five additional core courses, taken in at least two different departments. At least two of these courses must be taken outside the literature department.

Students plan their major in consultation with their German Studies faculty adviser, and submit it to the program director for approval.

The Minor

The minor in German Studies consists of seven courses, at least five of which must be upper-division, including:

German Studies 100 **or** 101
(literature department)

At least six additional core courses, taken in at least two departments.

Students plan their minor in consultation with their German Studies faculty adviser, and submit it to the program director for approval.

Core Courses

Courses marked with an asterisk (*) frequently cover topics bearing on German Studies. Students should check the departments' quarterly course descriptions and yearly course spreads for their applicability to the program, and discuss them in advance with their German Studies adviser.

GERMAN STUDIES

GMST 196A/B. Honors Thesis

HISTORY

HIEU 125. Reformation Europe

HIEU 132. German Politics and Culture: 1648–1848

HIEU 142. European Intellectual History: 1780–1870

HIEU 143. European Intellectual History: 1870–1945

HIEU 146. Fascism, Communism, and the Crisis of Liberal Democracy

HIEU 154. Modern German History

HIEU 155. Modern Austria

HIEU 177. Special Topics in Modern German Thought

LITERATURE

LTGM 2A. Readings and Interpretations

LTGM 2B. Advanced Readings and Interpretations

LTGM 2C. Composition and Conversation

LTGM 100. German Studies I: Aesthetic Cultures

LTGM 101. German Studies II: National Identities

LTGM 123. Eighteenth-Century German Literature

LTGM 124. Goethe

LTGM 125. Nineteenth-Century German Literature

LTGM 126. Twentieth-Century German Literature

LTGM 130. German Literary Prose

LTGM 131. German Dramatic Literature

LTGM 132. German Poetry

LTGM 160. Composition and Stylistics

LTGM 170. Literature and Ideas

LTEU 110. European Romanticism*

LTEU 130. German Literature in Translation

LTWL 4B. Fiction and Film in Twentieth-Century Societies*

LTWL 160. Women and Literature*

LTWL 170. Specialized Genres in Literature*

LTWL 172. Special Topics in Literature*

LTWL 176. Literature and Ideas*

LTWL 180. Film Studies and Literature: Film History*

LTWL 183. Film Studies and Literature: Director's Work*

LTWL 185. Film Studies and Literature: Interdisciplinary Issues*

MUSIC

MUS 113. Topics in Classic, Romantic, and Modern Music*

PHILOSOPHY

PHIL 106. Kant

PHIL 107. Hegel

PHIL 108. 19th-Century Philosophy*

PHIL 110. Wittgenstein

PHIL 180. Phenomenology

PHIL 181. Existentialism

PHIL 182. Marx and Marxism

PHIL 183. Topics in Continental Philosophy*

POLITICAL SCIENCE

POLI 110C. Revolution and Reaction: Political Thought from Kant to Nietzsche

POLI 114B. Marxist Political Thought

POLI 120B. The German Political System

POLI 120D. Germany: Before, During, and After Division

POLI 120H. European Integration*

SOCIOLOGY

SOCA 101M. Marxism, Culture, and Politics

SOCD 178. The Holocaust

THEATRE AND DANCE

THHS 101. Topics in Dramatic Literature and Theatre History*

THHS 102. Masters of Theatre*

Greek Literature

See Literature.

Health Care–Leadership of Healthcare Organizations

OFFICE: La Jolla Village Professional Center
8950 Villa La Jolla Drive, Suite C215
(858) 964-1017
unexhealthcare @ucsd.edu
http://health-execed.ucsd.edu/mas/lhco.html

Program Directors

Richard Kronick, Ph.D., *Associate Professor and Chief, Division of Healthcare Sciences, Family and Preventive Medicine*
Charles Mittman, M.D., *Professor of Clinical Medicine and Special Assistant for Clinical Affairs*

Associated Faculty

Gloria E. Bader, Ed.D., *The Bader Group*
Theodore Ganiats, M.D., *Professor, Family and Preventive Medicine*
Robert H. Kaplan, Ph.D., *Torrey Pines Health Group*
Robert M. Kaplan, Ph.D., *Professor, Chair, Family and Preventive Medicine*
David Kraus, J.D., MPH, *UCSD Healthcare*
Daniel Masys, M.D., *Associate Clinical Professor, Biomedical Informatics*
Brian Mittman, Ph.D., *Center for the Study of Healthcare Provider Behavior, VA Greater Los Angeles Healthcare System*
Robert Resnik, M.D., *Professor, Reproductive Medicine*
David Sakai, C.P.A., MBA, *Chief Financial Officer, UCSD Health Sciences*
Maria Savoia, M.D., *Professor, Clinical Medicine*
Matthew Weinger, M.D., *Professor, Anesthesiology*
Douglas Werner, M.A., *Torrey Pines Health Group*
Michael Willoughby, Ph.D., *Lecturer, Economics*

Program Description

The **Master of Advanced Studies (MAS) in the Leadership of Healthcare Organizations** provides depth and focus on management for health care professionals with an emphasis on clinical process improvement. The goal of the program is to prepare health care professionals to participate more effectively in the business decisions that affect the quality of patient care by teaching participants to deal with error prevention, process quality, and systems of care. Students gain the advanced knowledge and skills that are essential to manage escalating challenges in the competitive business environment of health care. The MAS program crosses many fields and clinical and administrative professions in the health industry, including medicine, nursing, mental health, dentistry, insurance, pharmacy, and other related areas. The program is appropriate for nurses, managers, physicians, allied health professionals, health care executives, and medical students as they assume more active roles in health care leadership and on management teams.

The MAS in the Leadership of Healthcare Organizations is a part-time, self-supporting degree program with a flexible course schedule designed for working professionals. It is the first graduate degree of its kind within the University of California system. The UCSD graduate division confers the MAS degree and the Department of Family and Preventive Medicine in the UCSD School of Medicine is responsible for the academic management of the curriculum. UCSD Extension administers the program and provides student advising and career counseling services.

Admission

New students are admitted in the fall, winter, and spring quarter of each academic year. Prospective candidates should submit and complete the official UCSD online graduate application for admission, the application fee, one set of official transcripts from each institution attended after high school, three letters of professional recommendation, and a current résumé or c.v. The GRE/GMAT is not required; however, it is strongly recommended that candidates have a minimum of five years of professional experience in health care. International applicants must submit official scores from the Test of English as a Foreign Language (TOEFL). The application deadlines are July 15 (fall), November 15 (winter), and January 15 (spring).

Program of Study

The part-time degree program is designed to be completed in one, two, or three years, depending upon a participant's time to devote to the program. Classes are typically scheduled in the late afternoons, evenings, or weekends to meet the demands of working professionals. Students are required to complete thirty-six units of core courses and two prerequisite courses. The prerequisite courses may be taken concurrently with the core courses in the MAS program or prior to being admitted in the degree program.

PREREQUISITES

LHCO 201. Topics in Health Care Management and Innovation—Health Care Finance and Systems

LHCO 201B. Topics in Health Care Management and Innovation—Managing in a Complex Health Care Environment

CORE CURRICULUM

LHCO 201C. Topics in Health Care Management and Innovation—Forums with the Experts (2)
This seminar-style course includes weekly discussions with health care entrepreneurs and managers to expose students to real-life experiences. How are solutions to health care delivery problems identified and implemented? How are solutions brought to the marketplace?

LHCO 202. Organizational Dynamics and Change Management (4)
This course examines principles and applications of management and organization theory as applied to health care organizations. It covers methods for assessing key features of organizational environments and internal structures and identifying, developing, and implementing strategies for improved performance.

LHCO 203. Using and Managing Information and Information Technologies (4)
Designed to familiarize health administrators and professionals with the principles of information systems design and management for health care. Provides an understanding of current trends in information technologies for health care and management issues unique to it. Includes hands-on computer lab.

LHCO 204. Managing People and Teams (2)
(Cross-listed with SOMI 256.) This course studies key management concepts and roles of management and how they apply in successful, dynamic organizations. It also examines competencies of effective managers in developing customer focus, planning, selecting and developing individuals and teams, communicating, managing resources, using technology and being adaptable.

LHCO 205. Modern Health Care Organizations (4)
Describes and analyzes the dynamics responsible for the change in health care delivery and effects on development of modern health care organizations. Describes actions taken by employers, insurers, consumers, and government, analyzing the effects on physicians and provider organizations. **Note**: It is recommended that students take this course in their first winter quarter in the program.

LHCO 206. Topics in Financial Management and Decision Making (2)
This course presents real-life applications in health care provider organizations of financial management and decision-making. Topics include budgeting, uses of financial reports, development of long-range financial forecasts, benchmarking, business plan development, and actuarial analysis in projecting health care delivery costs.

LHCO 207. Health Law and Medical Liability (4)
This course provides an introduction to the relationship of law to health care, including liability, government regulation, financial and ethical issues, contracting and negotiation and dispute resolution.

LHCO 208. Financial Management and Decision Making (4)
This course analyses the impact of time and risk on investment decisions. Financial accounting will be reviewed to understand financial information within an organization including uses and limitation of such information for management purposes. Discussion of procedural aspects of accounting to explicate basic concepts.

LHCO 209. Patient Outcomes and Quality of Care (4)
This course provides a critical overview of the tools used to measure outcomes and quality of care, development and use of practical guidelines, advantages and disadvantages of various methods, and the use of such analysis in administrative decision-making.

LHCO 210. Assessment of Medical Technology (2)
This course covers assessment methodologies, balancing concerns for economics and impact on care, investment strategy, and relationships with developers, vendors, and suppliers.

LHCO 211. Healthcare Leadership and Political Advocacy (2)
Within the context of healthcare advocacy, the course examines the organizational and individual issues that impact success in promoting and advocating for a healthcare agenda. The course aims to provide clarity to that process and assist students with understanding how to navigate the political landscape. Students learn about the legislative process, lobbying, the impact of political campaigns, the involvement of the media, and how healthcare economics impact politics.

LHCO 296. Independent Study in the Management of Health Care Organizations (4)
Students will be involved in an administrative project in UCSD Healthcare or another health care organization in San Diego. The student's experience will be the basis for a report as a requirement for graduation.

Health Care–Social Issues

OFFICE: Interdisciplinary Programs, Literature Building, Second Floor, Room 3238, Warren College

Health care–social issues is an interdisciplinary minor designed to enhance students' competence in analyzing complex social and ethical implications and ramifications of health care issues, policies, and delivery systems. Students gain an understanding of how the economy, culture, technology, sociological and psychological processes influence modern health care. Although it is administered by Warren College, it is available to all UCSD students with a general interest in health care as well as to students considering health care careers. This minor offers UCSD students the opportunity to examine health care-related issues from the perspectives of a wide range of disciplines that include anthropology, contemporary issues, economics, ethnic studies, philosophy, psychology, sociology, urban studies, and science and technology. By bringing together course work from these academic departments, this interdisciplinary curriculum offers a breadth of intellectual experience that enhances students' undergraduate education and their preparation for professional and postgraduate education in health care professions.

Students should consult an academic adviser in their college provost's office to determine how the health care–social issues minor can best meet their college's graduation requirements. Declarations must first be reviewed and approved by the coordinator of Interdisciplinary Programs and then by the student's college academic advising office.

Students are strongly urged to supplement the health care–social issues minor with a health-related internship. The Academic Internship Program offers internship placements in clinical settings and with medical research teams that provide valuable experience, career clarification, and an opportunity to apply theories learned in course work. Juniors and seniors with at least a 2.5 overall grade-point average (some placements require a 3.0 GPA) are eligible and can earn from four to sixteen units of academic credit for the internship experience.

Further information on related programs and activities is available at the Interdisciplinary Programs Office, Literature Building, Second Floor, Room 3238, Warren College, or call (858) 534-1704. Web site: http://warren.ucsd.edu/health

Health Care–Social Issues Minor Requirements

The minor consists of seven courses (three required and four electives). At least five courses must be taken at the upper-division level. Upper-division courses must not overlap with courses in the student's major and must be distributed in two or more disciplines. For full descriptions of the following courses, please see departmental listings.

The health care–social issues minor is applicable as a Warren College program of concentration in the social sciences.

Required Courses

Sociology/L 40—Sociology of Health Care Issues
Philosophy 163—Bio-Medical Ethics

One course in Urban Studies and Planning chosen from the following:

143—The U.S. Health Care System
144—Environmental and Preventive Health Issues
145—Aging: Social and Health Policy Issues
147—Case Studies in Health Care Programs: The Poor and Underserved

(Additional urban studies and planning courses may be taken to fulfill elective requirements in the minor.)

Elective Course Options

Anthropology

Lower-Division

2—Human Origins

Biological Sciences
101—Topics in Biomedical Anthropology
141—The Evolution of Human Diet

General
100—Topics in Sociocultural Anthropology (approval required)
128—The Anthropology of Medicine

Contemporary Issues
22—Human Sexuality
40—The AIDS Epidemic
136—The Anthropology of Medicine

Economics
138A-B—Economics of Health

Ethnic Studies
142—Medicine, Race, and the Global Politics of Inequality

Philosophy
147—Philosophy of Biology
148—Philosophy and the Environment
151—Philosophy of Neuroscience
162—Contemporary Moral Issues
164—Technology and Human Values
165—Professional Ethics

Psychology
2—General Psychology: Biological Foundations
60—Introduction to Statistics
104—Introduction to Social Psychology
124—Introduction to Clinical Psychology
132—Hormones and Behavior
134—Eating Disorders
153—Clinical Psychology
154—Behavior Modification
155—Social Psychology and Medicine
163—Abnormal Psychology
168—Psychological Disorders of Childhood
169—Brain Damage and Mental Function
172—Psychology of Human Sexuality
179—Drugs, Addiction, and Mental Disorders
181—Drugs and Behavior
188—Impulse Control Disorders

Science, Technology, and Public Affairs
181—Elements of International Medicine

Sociology

Lower-Division
60—The Practice of Social Research

Cluster B
120S—Special Topics in Culture, Language, and Social Interaction (prior approval of topic required)
143—Suicide

Cluster C
134A—The Making of Modern Medicine
134B—Medicine in the Twentieth Century
135—Medical Sociology
136A—Sociology of Mental Illness: Historical Approach
136B—Sociology of Mental Illness in Contemporary Society
137—Knowledge and Practice in Biomedicine
138—Genetics and Society
159—Special Topics in Social Organizations and Institutions (prior approval of topic required)

Urban Studies and Planning
143—The U.S. Health Care System
144—Environmental and Preventive Health Issues
145—Aging: Social and Health Policy Issues
147—Case Studies in Health Care Programs: The Poor and Underserved

Recommended Internship Experience

Health care-related internship (AIP 197): to be arranged at least one quarter in advance through the Academic Internship Program, Literature Building, Second Floor, Warren College. Clinical and research placements are available. For each four units of credit, ten hours per week for one quarter plus a ten-page research paper are required

Hebrew Literature

See Literature.

History

OFFICE: Room 5016, Humanities and Social Sciences Bldg., Muir College
(858) 534-1996
history@ucsd.edu
http://historyweb.ucsd.edu

Professors

Michael A. Bernstein, Ph.D., *Academic Senate Distinguished Teaching Award*
Robert S. Edelman, Ph.D.
Joseph W. Esherick, Ph.D., *Hsiu Professor of Chinese Studies, Hwei-Chih and Julia Hsiu Endowed Chair in Chinese Studies*
David Noel Freedman, Ph.D., *Endowed Chair, Biblical Studies*
David M. Goodblatt, Ph.D., *Endowed Chair, Judaic Studies*
Deborah Hertz, Ph.D., *Herman Wouk Endowed Chair in Modern Jewish Studies*
Judith M. Hughes, Ph.D.
Christine F. Hünefeldt, Ph.D.
David S. Luft, Ph.D., *Academic Senate Distinguished Teaching Award*
Michael P. Monteón, Ph.D.
Michael E. Parrish, Ph.D.
Paul G. Pickowicz, Ph.D.
William H. Propp, Ph.D.
David R. Ringrose, Ph.D.
Eric Van Young, Ph.D., *Chair*
Daniel F. Vickers, Ph.D.
Robert S. Westman, Ph.D.

Associate Professors

Nancy Caciola, Ph.D.
Takashi Fujitani, Ph.D.
David G. Gutiérrez, Ph.D., *Academic Senate Distinguished Teaching Award*
Hasan Kayali, Ph.D., *Vice Chair*
Rachel Klein, Ph.D.
John A. Marino, Ph.D.
Michael Meranze, Ph.D.
Becky M. Nicolaides, Ph.D.
Naomi Oreskes, Ph.D.
Pamela B. Radcliff, Ph.D., *Academic Senate Distinguished Teaching Award*
Nayan B. Shah, Ph.D.
Stefan A. Tanaka, Ph.D.
Cynthia M. Truant, Ph.D.

Assistant Professors

Frank P. Biess, Ph.D.
Marta E. Hanson, Ph.D.
Weijing Lu, Ph.D.
Rebecca Jo Plant, Ph.D.
Stephanie E. Smallwood, Ph.D.
Daniel L. Widener, Ph.D.

Lecturer with Security of Employment

Ping C. Hu

Adjunct Faculty

Michal Belknap, Ph.D., *Professor, California Western School of Law*
Geoffrey Bowker, Ph.D., *Professor, Communication*
Amy Bridges, Ph.D., *Professor, Political Science*
Suzanne Cahill, Ph.D., *Associate Adjunct Professor*
William F. Deverell, Ph.D., *Associate Adjunct Professor, California Institute of Technology*
Paul Drake, Ph.D., *Professor, Political Science and Institute of the Americas Chair for Inter-American Affairs*
Steve Erie, Ph.D., *Professor, Political Science*
Ramón Gutiérrez, Ph.D., *Professor, Ethnic Studies and Chancellor's Associates Endowed Chair*
Peter H. Smith, Ph.D., *Professor, Political Science and Simón Bólivar Chair in Latin American Studies*

Emeritus Professors

Guillermo Cespedes, Ph.D.
Stanley A. Chodorow, Ph.D.
Gabriel Jackson, Ph.D.
Thomas A. Metzger, Ph.D.
Allan Mitchell, Ph.D.
Alden A. Mosshammer, Ph.D.
Earl Pomeroy, Ph.D.
Edward Reynolds, Ph.D.
Martin J. S. Rudwick, Ph.D.
Ramón Eduardo Ruíz, Ph.D.

The Undergraduate Program

"Whereas other subjects may make us smarter for next time," said the great historian of the Renaissance, Jakob Burckhardt, "the study of history makes us wiser forever." This major is, moreover, an excellent preparation for a number of rewarding careers in university and college teaching and research, law, government, diplomacy, international business, education, and even medicine. At the crossroads of the humanities, the arts, and the social sciences, history is the study of human experience as it has unfolded over the ages. As an academic discipline it presents a unique gateway both to the richness of our cultural heritage and to the immense variety of world civilizations.

Students wishing to declare a major in history should first consult with the Director of Undergraduate Studies. After determining the student's likely field of emphasis, the student should then select an appropriate faculty adviser. All undergraduate majors are strongly encouraged to consult with the faculty adviser at least once each quarter. Any difficulties in the advising procedure or in registration formalities should be reported to the director of Undergraduate Studies.

Department fields of emphasis are as follows: Africa (HIAF), East Asia (HIEA), Europe (HIEU), Near East (HINE), Latin America (HILA), History of Science (HISC), United States (HIUS); as well as the following three thematic fields: Gender and Sexuality; Race, Ethnicity, and Migration; and War, Revolution, and Social Change. A list of courses approved for the thematic fields is available in the department office or on its Web site, http://historyweb.ucsd.edu.

The department also administers the following special research and instructional units; Chinese Studies; Judaic Studies; and the Committee on Area and Ethnic Studies and Research (CAESAR), which includes African Studies, Classical Studies, German Studies, Italian Studies, Japanese Studies, Middle East Studies, Russian and Soviet Studies.

The department is fortunate in having the research and professional activities of its faculty supported by the Laura and John Galbraith Faculty Development Fund.

Basic requirements for the major are as follows:

1. A three-quarter lower-division sequence.
2. Twelve four-unit upper-division courses, which must include the following distribution of courses:
   a) Seven courses in a field of emphasis. (In certain cases, with approval of the academic adviser, two of these courses may be in a neighboring discipline.)
   b) Five courses in other fields within the department.
   c) Three of the twelve courses must focus on the period before 1800. These courses are indicated by the symbol (+).
   d) At least one of the twelve courses must be a colloquium in which students would be required to write a substantial term paper. Colloquia are those courses with numbers between 160 and 190, or others approved by the undergraduate adviser. **Note:** The colloquium does not have to be in the major field of emphasis.

*Requirement 2d applies only to students entering UCSD after September 1, 1998.

Students majoring in history will normally take at least eight of their twelve upper-division history courses at UCSD. Exceptions to this rule may be made for transfer students and for students participating in the EAP/OAP program.

In special cases, upon approval of the director of Undergraduate Studies, students may devise a field of emphasis (e.g., economic, legal, or social history) other than those designated above. Special independent study courses, such as HITO 197, HITO 198, and HITO 199, are available for students. These courses are especially recommended for those students interested in the Honors Program and in Graduate study.

With the exception of 199 courses, all work in the major must be taken for a letter grade. Of the twelve upper-division courses required in the major, no more than two may be History 199 credits. (Exceptions to these rules may be allowed upon petition to the director of Undergraduate Studies.)

Lower-division sequences may be selected from the following:

HILD 2 A-B-C	United States History
HILD 7 A-B-C	Race and Ethnicity in the U.S.A.
HILD 10-11-12	East Asia

Students may also satisfy the lower-division requirement for the major by completing the Revelle College Humanities Sequence or the Fifth College Sequence, "Making of the Modern World." Students entering with AP credit in history may waive part of the lower-division requirement. Transfer students, after consulting with the director of Undergraduate Studies, may petition to substitute a two-semester or three-quarter survey from another school for the department's lower-division requirement.

Established in 1983, the Armin Rappaport Memorial Fund endows an annual prize for the outstanding graduating student in the major. The recipient of the award is announced at every June Commencement.

The Honors Program

The department offers a special program for outstanding students. The Honors Program is especially recommended for those students interested in pursuing graduate study in history or allied fields. It is also a particularly effective preparation for professional careers. Candidates for history honors are chosen during the spring quarter from among juniors in history who have taken at least four upper-division courses in the department. Juniors with a 3.5 GPA in history (3.0 overall) are eligible to apply. Admission to the program is based on the student's academic work. Interested candidates should complete the application form (available in the Department of History office) by the second Friday of May.

In addition to regular course work in the department, the honors program consists of a colloquium in historiography offered in the fall quarter of the senior year and a program of independent study leading to the completion of an honors essay on a topic of the student's choice. During the fall quarter of the senior year, candidates select a topic and begin preliminary work on the honors essay in consultation with a major field adviser (HITO 194). During the winter quarter the student pursues a course of independent study devoted to the completion of the honors essay (HITO 195). The award of history honors is based on satisfactory completion of the colloquium in history and the honors essay. Students are expected to maintain an average of 3.5 or better in all work taken within the department. Honors candidates must include at least three colloquia in their regular course work.

Candidates for history honors should organize their work as follows:

1. Six quarter-courses in one of the major fields offered by the department.
2. Three quarter-courses in a field other than the primary one.
3. Three of these nine quarter courses must be colloquia.
4. HITO 196. Colloquium in History;
5. HITO 194 and 195. History Honors—Honors Essay.

Minors in History

Effective winter quarter 1998, the minor consists of at least seven courses, five of which must be upper-divsion. Although there is no specific distribution requirement, the courses should be selected to constitute a coherent curriculum. No more than two upper-division courses applied to a minor may be taken for Pass/No Pass. Prospective minors in history should consult with an undergraduate adviser for approval of their program.

Education Abroad Program

Students are encouraged to participate in the UC Education Abroad Program (EAP) of UCSD's Opportunities Abroad Program (OAP), while still making progress toward completing their major. Students considering this option should discuss their plans with the departmental Educational Abroad faculty adviser before going abroad, and courses taken abroad must be approved by the department. (For more information on departmental procedures for study aboard see undergraduate program http://historyweb.ucsd.edu. EAP is detailed in the Educational Abroad Program of the *UCSD General Catalog*, or visit http://orpheus.ucsd.edu/icenter. Financial aid is applicable to study abroad, and study abroad scholarships are available. Interested students should contact the Programs Abroad Office in the International Center.

The Graduate Program

The Master's Program

The Department of History offers master's degrees in the fields of Chinese studies, modern European history (1500 to the present), history of science, Latin American history, and United States history. The department also provides the opportunity for students to design special M.A. programs in areas such as African history, medieval European history, and Judaic studies. In consultation with an appropriate faculty member, students may petition the department for approval for a special M.A.

Admission is based on the applicant's undergraduate preparation; previous graduate work, if any, three letters of recommendation; one or two papers (preferably written for history courses); and scores from the Graduate Record Examination (GRE). **The GRE subject exam in history is not required. The Test of English as a Foreign Language (TOEFL) is required for foreign applicants. A minimum score of 550 for the paper-based test or a score of 213 for the computer-based test is required on the TOEFL.**

The minimum grade-point average for admission is 3.0 with a higher average in history and related subjects. While proficiency in a foreign language is not an absolute requirement for admission (except in Latin American history, where a reading knowledge of Spanish is required), prospective applicants are strongly urged to begin study of a foreign language appropriate to the proposed area of concentration as early as possible in their academic career. With very few exceptions, students are expected to begin their programs in the fall quarter. Refer to the online application for filing deadline. **Master's students ordinarily do not receive financial aid from the department or the university except when funds are not utilized for support of Ph.D. candidates.**

For online application visit: http://www.ogsr.ucsd.edu/

General Requirements

Candidates for the master's degree are expected to finish the program in one academic year of full-time study or two years of part-time work. The program requires completion of thirty-six units, of which at least twenty units must be in colloquia, conjoined courses, directed readings, and seminars. In addition to course requirements, students must pass a comprehensive oral examination. Students in European or Latin American history and in certain special areas must demonstrate reading knowledge of at least one foreign language relevant to their course work.

Area of Concentration: Chinese Studies

Chinese studies is an interdisciplinary program that allows the graduate student interested in China to take advantage of the university's offerings in various departments to build a coordinated graduate program leading to an M.A. degree in history. Although the program is offered under the auspices of the Department of History, the student selects courses in the Departments of Anthropology, Linguistics, Literature, Political Science, and Sociology, as well as History.

Area of Concentration: Europe

Candidates for the M.A. degree in European history pursue a program concentrating on the history of modern Europe. The program provides background in earlier European history in order to place modern Europe in perspective. Some training in a discipline other than history is also recommended. The requirement of nine courses (thirty-six units) is normally distributed as follows:

1. A two-quarter research seminar, to be selected from HIGR 230, 231, or 232.
2. Three one-quarter courses concerning the historical literature about central problems in European history: HIGR 200, 220, 221, and 222 are the preferred options. If any of them are not scheduled for the year, other graduate-level colloquia may be substituted with approval of the student's graduate adviser.
3. Two courses in preindustrial Europe, 1450–1750: HIGR 200, 220, and 221 may be counted for this requirement.
4. Two courses in industrial Europe since 1750: HIGR 221 and 222 may be counted for this requirement, as well as appropriate graduate level colloquia.

   Note: HIGR 221 may NOT be used for both (3) and (4).
5. One course in a discipline other than history, if relevant to the student's program.

Area of Concentration: History of Science

The master's program in history of science provides a broad background in preparation for a variety of careers related to science and technology, business, journalism, education, government, or for more advanced degree work. The nine courses (thirty-six units) required are normally distributed as follows:

1. Two courses in science in early modern Europe.
2. Two courses in science since 1750.
3. A two-quarter research seminar.
4. The remaining courses are chosen in consultation with the faculty in history of science. For students whose previous training has been mainly scientific, these will include courses in historical fields other than the history of science. For students who already have historical training, they may include one or more courses related to the sciences.

Area of Concentration: Latin America

This program offers the student a general preparation in the history of Latin America. Students will have the opportunity to specialize in national or colonial periods and can emphasize work in one country. Advanced work in another discipline related to Latin America may also be included in the program. Thirty-six units normally should be distributed as follows:

1. HIGR 245A-B-C.
2. Three graduate courses in Latin American history.
3. Three other courses related to Latin America in history or in other disciplines.

Area of Concentration: United States

This area of concentration offers the M.A. candidate a broad grounding in the literature of American history from the colonial period to the present. In addition to a shared core of courses, students specialize in a topical field of their own choosing. Training in a related discipline outside of history is encouraged. The requirement of nine courses (thirty-six units) is ordinarily distributed as follows:

1. HIGR 265A-B-C. The Literature of American History. These colloquia are required of all entering graduate students in American history.
2. A two-quarter research seminar.
3. Two courses in a single topical field chosen from African-American history, history of the borderlands and Southwest, Chicano history, economic history, legal and constitutional history, political history, social and cultural history, history of the South, history of the West, or history of women and gender.
4. Two additional courses chosen in consultation with the student's adviser. These courses may be in a related field outside the department.
5. At least six of the nine courses must be colloquia or graduate-level courses. Students may take conjoined courses, directed readings, research seminars, or the 265 series to meet this requirement.

Ph.D. Program

Admission

The Department of History offers the doctor of philosophy degree in the fields of ancient history, East Asian history, European history, history of science, Latin American history, and United States history.

Admission is based on the applicant's undergraduate preparation; previous graduate work, if any; three letters of recommendation; one or two papers (preferably written for history courses); and scores from the Graduate Record Examina-tion (GRE). **The GRE subject exam in history is not required. The Test of English as a Foreign Language (TOEFL) is required for foreign applicants. A minimum score of 550 for the paper-based test or a score of 213 for the computer-based test is required on the TOEFL.**

The minimum grade-point average for admission is 3.0 with a higher average in history and related subjects. In most areas of concentration, knowledge of at least two foreign languages will be required during a student's academic career. In general, applicants are expected to have a reading knowledge of the languages most appropriate to their major field at the time of admission. Thus, students in ancient history, East Asian history, European history, history of science, and Latin American history should have a working knowledge of one foreign language at the time of admission. With very few exceptions, students are expected to begin their programs in the fall quarter. Refer to the online application for filing deadline.

For online application visit: http://www.ogsr.ucsd.edu/

Fields of Study

During the first year of residence each student, after consulting with a graduate adviser in the area of concentration, selects one major field of study and two minor fields. Within a major field the student should indicate a special interest from which the dissertation may develop. The first minor is ordinarily a supplementary field within the student's area of concentration, while the second minor is a complementary field outside the area of concentration. The basic programs of study are as follows:

I. ANCIENT HISTORY

Students in ancient history will be expected to demonstrate a broad mastery of the entire field, with special concentration as follows:

A. Major Fields

1. The history of Israel in the biblical period.
2. The history of the Jewish people in antiquity.

B. First Minor

1. One of the fields listed above not chosen as the major field.
2. Greek and Roman history.
3. The Middle East before Islam (western Asia and northeastern Africa from the sixth century B.C.E. to the seventh century C.E.)

C. Second Minor

1. A field of history outside of ancient history.
2. A related discipline, offered through another department.

D. Language Requirements

1. All students will be expected to demonstrate a reading knowledge of two modern foreign languages, usually French and German. This requirement may be satisfied by any of the means recognized by the department.
2. All students will be expected to demonstrate a reading knowledge of at least one and usually two of the three following ancient languages: Greek, Hebrew, and Latin. The languages will be chosen as appropriate to the student's particular interests and the requirement will be satisfied by departmental examination.
3. The second and sometimes third language not elected under (2) may be required if necessary for the student's research. Additional languages, such as Akkadian, Aramaic, Egyptian, Ugaritic, Phoenician, and middle and modern Hebrew, may be required as necessary for the student's research. The required level of competence will be set as appropriate to the student's needs and the requirement will be satisfied by departmental examination.

II. EAST ASIAN HISTORY

Students in East Asian history will be expected to demonstrate a broad competence in the entire field, with special concentration as follows:

A. Major Fields

1. Modern China
2. Modern Japan

B. Minor Fields

For students majoring in Chinese history, students will be expected to pass three minor fields in order to broaden each student's perspective on East Asian history:

1. Premodern Chinese history.
2. Modern Japanese history.
3. A history field outside of East Asia, or a discipline outside of history.

For students majoring in Japanese history:

1. A field in history.
2. A related field offered through another department.
   Note: One of the minor fields must not focus exclusively on East Asia.

C. Language Requirements

For students majoring in Chinese history: students must demonstrate a reading knowledge of Chinese and a reading knowledge of a second foreign language related to the student's research interests.

For students majoring in Japanese history: students must demonstrate a reading and speaking knowledge of Japanese. Depending on specialization, reading knowledge of a second foreign language might be necessary.

III. EUROPEAN HISTORY

The graduate program in European history is designed to achieve a dual objective: to encourage a broad mastery of historical methods and literature in various fields, as well as to develop a special focus of research within a single area or epoch. The distribution of offerings is as follows:

A. Major Fields

1. Modern Europe, with a specialty in Britain, France, Germany, Italy, Spain, diplomatic history, economic history, intellectual history, or social history.
2. Early modern Europe, with a specialty in the cultural, economic, or social history of one region.

B. First Minor

Any of the following fields may be selected provided that the study concentrates on a chronological period outside the major.

1. Classical Greece and Rome
2. Medieval Europe
3. Early modern Europe
4. Modern Europe
5. A national history

C. Second Minor

1. The history of a geographic area outside of Western Europe
2. History of science
3. Women's history
4. A related discipline, offered through another department.

D. Language Requirements

The department requires Ph.D. candidates in European history to demonstrate competency in two languages in addition to English before advancement to candidacy.

IV. HISTORY OF SCIENCE

Note: Students should indicate whether they are also applicants for admission to the interdepartmental program in Science Studies (history, philosophy, and sociology of science).

A. Major Fields

1. Science in early modern Europe.
2. Science in the eighteenth and nineteenth centuries.
3. Science in the twentieth century.
4. Another field of comparable breadth, defined in consultation with the major field adviser.

B. First and Second Minor Fields (Any two of the following may be selected, in consultation with the major field adviser.)

1. Science Studies (mandatory for students in the Science Studies program).
2. Any of the other fields offered by the department, provided that it offers general historical understanding of the same period as the major field.
3. A field of history of science not chosen as the major field.

4. A second field of history, provided that it concentrates on a period or region other than that chosen for the first minor field.
5. A related discipline, offered through another department. **Note**: this field may be in the physical or life sciences.

C. Language Requirements

Competency in one or two languages in addition to English before advancement to candidacy is required. The requirement will vary depending on chosen major field.

V. LATIN AMERICAN HISTORY

Doctoral candidates in Latin American history are expected to gain a broad chronological and geographical mastery of the field as a whole. The oral examination in the major field, while concentrating on the student's special area of interest, will be a comprehensive examination covering the whole field of Latin American history.

A. Major Fields

1. The national period of Latin America, with a specialty in the Andean Republics, Brazil, the Caribbean, Mexico, or the Southern Cone countries.
2. Colonial Latin America, with an emphasis on one major region.

B. First Minor

The student should select either the national period or the colonial period as a chronological supplement to the major.

C. Second Minor

1. The history of another geographic area outside Latin America and the Caribbean.
2. An area of discipline, offered through another department, related to the student's dissertation or preparation for university teaching.

D. Language Requirement

Competency in two languages in addition to English before advancement to candidacy is required. Normally the first of these will be Spanish. The second may be Portuguese or another European or non-European language, including an indigenous language of the Americas.

VI. UNITED STATES HISTORY

A. Major Fields

1. Colonial and National period to 1877.
2. Modern America, 1877 to the present.

B. First Minor

1. One of the above fields not chosen as the major field.
2. One of the following topical fields:

African-American history, history of the borderlands and Southwest, Chicano history, economic history, legal and constitutional history, political history, social and cultural history, history of the South, history of the West, or history of women and gender.

C. Second Minor

1. A geographic area outside the United States in either the premodern or modern period.
2. A related discipline offered through another department.

D. Language Requirement

Competency in one language in addition to English before advancement to candidacy is required.

E. Third Year Seminar

U.S. History students in their third year of study will be required to complete HIGR 271, New Research Directions in U.S. History, in both the winter and spring quarters.

VII. DUAL DEGREE PROGRAM

Students who wish to earn both the Ph.D. in history from UCSD and the Juris Doctor from California Western School of Law must apply to and be independently accepted into both programs under each of the campus' standards and procedures.

Students pursuing the dual degree program will normally alternate years at each institution, in a manner agreed on by the students' advisers and appropriate committees. Thus, for example, a student may spend his or her first year at Cal Western, his or her second year at UCSD, and so on through the program. At least one year at each institution must be completed by the end of three years.

Each institution will accept a small number of course credits from the other institution to satisfy its degree requirements. Cal Western remains on a semester system, while UCSD continues on a quarter system. With the exception of the historiography and research seminars and subject to approval by a faculty adviser and the graduate committee, the Department of History will accept for credit up to two classes from Cal Western.

VIII. OTHER FIELDS

Students may be admitted to graduate study leading to the Ph.D. in fields other than those listed above upon the recommendation of an appropriate faculty member. In such cases, a special program of study appropriate to the field will be devised by the major field adviser, subject to the approval of the department's graduate committee.

Note: The department also offers graduate work in African history. When appropriate, students may select a minor field in this area.

Ph.D. Course Work

A normal full-time program consists of 12 units per quarter. Ph.D. students are expected to complete at least one of the following minimum formal courses of study prior to their qualifying examination: (1) two two-quarter research seminars, three one-quarter historiography courses in their major field and five other courses (which may be a combination of colloquia, conjoined courses, or directed readings); or (2) three two-quarter research seminars (not necessarily in the same field), three one-quarter historiography courses in their major field, and three other courses (which may be a combination of colloquia, conjoined courses, or directed readings). Students are encouraged to take their first research seminar in their major field during the initial year of graduate study. A maximum of four units per quarter may be taken in teaching assistantships.

Part-time Study

Students who enroll in fewer than twelve graduate or upper-division units per quarter are considered part-time students. Part-time study may be pursued in several master's programs and a few Ph.D. programs at UCSD. Approval for individual students to enroll on a part-time basis may be given for reasons of occupation, family responsibilities, or health. Individuals who are interested in part-time study and meet the above qualifications should see the department's graduate coordinator.

Part-time students must satisfy the same admission requirements as full-time students and are eligible, at the discretion of the department, for 25 percent time teaching or research assistantships. Students who are approved by the dean of Graduate Studies and Research for

enrollment in a program of half-time study or less (maximum of six units) may be eligible for a reduction in fees. All other students pay the same fees as full-time students.

Ph.D. and M.A. Language Requirements

Ph.D. candidates in Chinese, European, and Latin American history must demonstrate competency in two foreign languages. Ph.D. candidates in history of science, Japanese, and United States history, as well as M.A. candidates in European and Latin American history, must demonstrate competency in one foreign language. Ph.D. candidates in ancient history require two modern foreign languages as well as the relevant ancient languages. Additional languages appropriate to the special field of study as well as language requirements for a candidate in a field other than those already mentioned may be required by the Graduate Committee in consultation with the student's major field adviser. Students may satisfy the foreign language requirement in one of the following ways:

A. By completing, with a grade of B- or better in each term, a two-year language sequence from the student's undergraduate institution. Such a sequence must have been completed within two years of the time the request is made to the Graduate Committee for certification of competency.

B. By completing, with a satisfactory (S) grade in each term, a two-year, lower-division sequence in the language approved by the Graduate Committee.

C. By completing, with a satisfactory (S) grade in each term, a one-year, upper-division sequence in the language approved by the Graduate Committee.

D. By passing a translation examination administered by a departmental faculty member who is proficient in the language. (This is the only option available for Chinese and Japanese.)

Students are urged to complete at least one foreign language examination by the end of the first year of study and must do so by the beginning of their third year. *Failure to meet this requirement is grounds for denial of financial support.* No student may take the oral qualifying examination before completing all language requirements.

Ph.D. Examinations

A. Minor Fields

Ph.D. candidates are strongly encouraged to take at least one minor field examination by the end of fall quarter of their second year and to complete all examinations by the end of their third year. Generally, the department recognizes two types of minor fields. The most common minor field is a teaching field. That is, passing a minor field in an area certifies, on a student's record and resume, that the student has mastered the literature and the major issues in a field sufficient to qualify the student to teach in that area. (An example would be a minor field in modern Japanese history for an East Asian history student specializing in modern China; or medieval history for a Europeanist.) A second type of minor field is designed to familiarize a student with a range of theoretical and comparative issues which will be useful in the formulation of a dissertation topic and future research in the student's major field. (An example might be Latin American history for a student working in United States ethnic history; or sociology for a student in any field.) For a minor field taken outside the department, the minor field adviser (not the student or major field adviser) determines the level of expertise sufficient to warrant certification in that field.

Reading lists are negotiated between students and their minor field adviser, but, as a guideline, they should include about 50 titles with 40–70 titles representing a reasonable range. The reading list is agreed upon, at least three months in advance, by the student and faculty member administering the minor field examination. The list is intended to establish what will be expected of the student and to prevent confusion over the material to be covered. Most minor fields include a written examination; these may be in the form of a three-hour departmental exam or a twenty-four hour take-home exam at the administering professor's discretion. (Minor field examinations in East Asian history will be oral; those in history of science may be either written or oral.) The professor composes and grades the written examination.

Students who fail a minor field examination may petition the Graduate Committee for permission to sit for the examination again at any time during the following two quarters, as long as pre-candidacy time limits are not exceeded. A second failure results automatically in dismissal from the program.

B. Oral Qualifying Examination and Candidacy

Students are normally expected to take their qualifying examination no later than the spring of their third year of study (except as otherwise specified by the individual fields), and are required to do so in four years. Students must fulfill all course work, minor field, and language requirements before taking their qualifying examination. The qualifying examination is an oral test in the student's major field of study, conducted by at least five examiners: three of whom must be members of the Department of History and two from a discipline outside the department (at least one examiner must be a tenured faculty member). Or, four examiners from the Department of History (with one member outside the student's field group), and with at least one tenured faculty member from a discipline outside the department. Students should consult with their adviser about the composition of the examining committee well before their examination. The examination committee also serves as the dissertation committee. The membership of the committee must be approved by the Department Chair and ultimately the Dean of graduate studies. The date of the examination is determined by consultation between the candidate and the examining committee. In addition to the major field book list, it is required that students also submit a dissertation prospectus to the committee before the oral examination. The examination, which will include a discussion of the student's prospectus, lasts approximately two to three hours.

Should a candidate fail the examination, the examining committee will consult with the student to clarify weaknesses in preparation for taking the examination a second time. If a second oral examination is warranted, the department requires that it should be taken no later than one quarter after the first examination. If the candidate fails the oral examination a second time, his or her candidacy will be terminated.

An M.A. degree may also be awarded to continuing Ph.D. students upon successfully passing the oral qualifying examination. The M.A.

is not automatically awarded; students must apply in advance to receive the degree. **Note**: Students who wish to receive an M.A. degree as part of the Ph.D. program must apply for master's degree candidacy during the first two weeks of the quarter in which they expect to receive the degree. Please see the graduate coordinator regarding this application.

The various requirements noted above apply to students who have done no previous graduate work in history. If a candidate has completed some graduate work before entering UCSD, there may be appropriate adjustments in course work, as approved by general petition to the Graduate Committee. Nevertheless, all candidates are required to meet language requirements, pass field examinations, as well as complete and defend a dissertation.

Dissertation

After completing all relevant examinations and language requirements, the student is expected to write a dissertation under the supervision of his or her faculty adviser and the doctoral committee. The Department of History has established the following guidelines for dissertation work. The dissertation should:

- represent an original and significant contribution to knowledge.
- be based upon primary research.
- clearly demonstrate the capacity of the student to pursue independent historical research.
- be written in clear and coherent prose.

Decisions concerning the scope of the dissertation and its length will depend upon the nature of the problem and the documentation. The department assumes that most students will have completed their research and writing by the end of their sixth year of study. The scope and length of the dissertation should therefore be such that a complete project can be executed in no more than three years. Whatever the scope or length of the dissertation it should be capable of further development for publication as a series of articles in scholarly journals, or as a book.

Departmental Ph.D. Time Limit Policies

Students must be advanced to candidacy by the end of four years. Total university support cannot exceed seven years. Total registered time at UCSD cannot exceed eight years.

Opportunities for Teaching

Undergraduate teaching, for which graduate teaching assistants earn regular academic credit, is an integral part of the graduate program at UCSD. To prepare for an academic career, the Ph.D. candidate is encouraged to assist in courses offered by the department ordinarily as a course reader (grader) or teaching assistant. A maximum of four units per quarter may be taken in undergraduate teaching. When such an opportunity is not available, a student may teach in various programs outside the department.

The department considers experience in teaching an important part of a graduate student's professional training. Based upon financial aid forms that graduate students complete during the previous winter quarter, the Graduate Committee assigns History Department teaching assistantships and recommends teaching assistantships outside of the department for the upcoming academic year.

Students must maintain a minimum grade-point average of 3.0 in order to receive academic employment on campus.

Financial Support

Upon recommendation of the department, several types of financial aid are available to graduate students: full or partial remission of fees and tuition, fellowships, research assistantships, teaching assistantships, readerships, and travel grants. Graduate students are eligible for one or a combination of the six forms of financial support.

Fellowships and research assistantships are granted by the Office of Graduate Studies and Research (OGSR) upon the recommendation of the department. Teaching assistants are appointed by the department upon the recommendation of the graduate committee and by the college writing programs. Readers are appointed by the department upon the recommendation of the professor whose course requires such assistance. At the discretion of the department, half-time graduate students are eligible for 25 percent TAships or GSRships.

For a small number of outstanding incoming students, the department will award a four year package of guaranteed funding which would include two years of a fellowship and two years of employment as a teaching assistant.

Departmental policy has been to seek seven years of support for students in the program. In recent years all students needing support have received either fellowships, or teaching assistant, research assistant positions. To the extent that resources are insufficient to meet the need, the department, on the advice of the graduate committee, will rank students using a combined criterion of academic performance and financial need.

Graduate students must maintain a minimum grade-point average of 3.0 to be considered for any type of financial aid. Financial support is not renewed automatically but is approved by the department on a yearly basis.

The Office of Graduate Studies and Research grants partial remission of fees for nine quarters after advancement to candidacy ("normative time") if the student is advanced to candidacy by the end of the third year. (If the student delays advancement, the amount of normative time is reduced accordingly.) Upon expiration of normative time the student must complete the dissertation or resume full payment of fees.

Job Placement

In recent years, 75 percent of the department's Ph.D. graduates received positions as tenure-track assistant professors at colleges and universities around the country. The remaining 25 percent are currently administrators, visiting scholars, lecturers, or postdoctoral fellows at various educational institutions. Experience indicates that many from this latter group will eventually get professional appointments.

COURSES

LOWER-DIVISION

HILD 2A-B-C. United States
A year-long lower-division course that will provide students with a background in United States history from colonial times to the present, concentrating on social, economic, and political developments. (Satisfies Muir College humanities requirement and American History and Institutions requirement.)

HILD 7A-B-C. Race and Ethnicity in the United States
Lectures and discussions surveying the topics of race, slavery, demographic patterns, ethnic variety, rural and urban life in the U.S.A., with special focus on European, Asian, and Mexican immigration.

HILD 7A. Race and Ethnicity in the United States (4)
A lecture-discussion course on the comparative ethnic history of the United States. Of central concern will be slavery, race, oppression, mass migrations, ethnicity, city life in industrial America, and power and protest in modern America.

HILD 7B. Race and Ethnicity in the United States (4)
A lecture-discussion course on the comparative ethnic history of the United States. Of central concern will be the Asian-American and white ethnic groups, race, oppression, mass migrations, ethnicity, city life in industrial America, and power and protest in modern America.

HILD 7C. Race and Ethnicity in the United States (4)
A lecture-discussion course on the comparative ethnic history of the United States. Of central concern will be the Mexican-American, race, oppression, mass migrations, ethnicity, city life in industrial America, and power and protest in modern America.

HILD 10-11-12. East Asia
A lower-division survey that compares and contrasts the development of China and Japan from ancient times to the present. Themes include the nature of traditional East Asian society and culture, East Asian responses to political and economic challenges posed by an industrialized West, and war, revolution and modernization in the twentieth century.

HILD 10. East Asia: The Great Tradition (4)
Examines the evolving characteristics of East Asian culture and civilization before 1600. Contrasts the rise of imperial Confucian governance in China to the development of feudal society in Japan.

HILD 11. East Asia and the West (4)
Compares Chinese and Japanese responses to Western imperialism after 1600, focusing on popular protest and dynastic decline in China and the rise of the modernizing nation state in Japan.

HILD 12. Twentieth-Century East Asia (4)
Deals with the rise of East Asia in the Pacific Century. This course stresses the emergence of a regionally dominant Japan before and after World War II and examines the process of revolution and state-building in China during the Nationalist and Communist eras.

UPPER-DIVISION

Please note: The following upper-division courses are offered on a regular basis, although not every class is available every year. Check with the department to see what is available each quarter.

AFRICA

Lecture Courses

HIAF 110. History of Africa to 1880 (4)
A survey of pre-colonial Africa, concentrating on ancient Africa, Islam, state formation, the slave trade and abolition, and European penetration of the interior. *Prerequisite: upper-division standing.* +

HIAF 111. Modern Africa Since 1880 (4)
A survey of African history dealing with the European scramble for territory, primary resistance movements, the rise of nationalism and the response of metropolitan powers, the transfer of power, self-rule and military coups, and the quest for identity and unity. *Prerequisite: upper-division standing.*

HIAF 120. History of South Africa (4)
The origins and the interaction between the peoples of South Africa. Special attention will be devoted to industrial development, urbanization, African and Afrikaner nationalism, and the origin and development of apartheid and its consequences. *Prerequisite: upper-division standing.*

HIAF 122. Traditional African Religions (4)
A study of the meaning, structure, and sources of African traditional religion. The course examines the attitudes of mind and belief and practices which have evolved in many societies in Africa. +

HIAF 130. African Society and the Slave Trade (4)
Topics include trans-Saharan trade, slavery with African societies, Atlantic slave trade, East African slave trade, problems of numbers exported and profitability, impact of slave trade on African society, and the abolition of the slave trade. *Prerequisite: upper-division standing.*

Colloquia

The following courses are available to both undergraduate and graduate students. Undergraduates must receive a departmental stamp or permission of the instructor to register for the course. Requirements for each course will differ for undergraduate, M.A., and Ph.D. students.

HIAF 161/261. Special Topics in African History (4)
This colloquium is intended for students with sufficient background in African history. Topics, which vary from year to year, will include traditional political, economic, and religious systems, and theory and practice of indirect rule, decolonization, African socialism, and pan-Africanism. *Department stamp required.*

HIAF 199. Independent Study in African History (4)
Directed readings for undergraduates. *Prerequisite: consent of instructor and academic adviser required.*

EAST ASIA

Lecture Courses

HIEA 111. Japan: Twelfth to Mid-Nineteenth Centuries (4)
Covers important political issues—such as the medieval decentralization of state power, unification in the sixteenth and seventeenth centuries, the Tokugawa system of rule, and conflicts between rulers and ruled–while examining long-term changes in economy, society, and culture. +

HIEA 112. Japan: From the Mid-Nineteenth Century through the U.S. Occupation (4)
Topics include the Meiji Restoration, nationalism, industrialization, imperialism, Taish™ Democracy, and the Occupation. Special attention will be given to the costs as well as benefits of "modernization" and the relations between dominant and subordinated cultures and groups within Japan.

HIEA 113. The Fifteen-Year War in Asia and the Pacific (4)
Lecture-discussion course approaching the 1931-1945 war through various "local," rather than simply national, experiences. Perspectives examined include those of marginalized groups within Japan, Japanese Americans, Pacific Islanders, and other elites and nonelites in Asian and Pacific settings.

HIEA 114. Postwar Japan (4)
Examines social, cultural, political, and economic transformations and continuities in Japan since World War II. Emphases will differ by instructor. *Prerequisite: upper-division standing.*

HIEA 115. Social and Cultural History of Twentieth-Century Japan (4)
Japanese culture and society changed dramatically during the twentieth century. This course will focus on the transformation of cultural codes into what we know as "Japanese", the politics of culture, and the interaction between individuals and society.

HIEA 116. Japan-U.S. Relations (4)
Survey of relations between Japan and the United States in the nineteenth and twentieth centuries. Although the focus will be on these nation-states, the course will be framed within the global transformation of societies. Topics include cultural frameworks, political and economic changes, colonialism and imperialism, and migration.

HIEA 120. Classical Chinese Philosophy and Culture (4)
Course covers the period from the second millennium B.C. to second century A.D. This is a formative period in Chinese history, witnessing the flowering of philosophical schools–Confucianism, Taoism, and Realism. It was also during this period that the foundations of Chinese political and social structures were laid down. +

HIEA 121. Medieval Chinese Culture and Society (4)
This course covers the period from the sixth century to thirteenth century, the time of the glorious T'ang and Sung dynasties. We focus on the "medieval revolution" that changed the political, economic, and social life of the empire. As much as possible we study these changes from the eyes of the people who lived through them–aristocrats, peasants, soldiers, merchants, women. *Prerequisite: HIEA 120 recommended but not required.* +

HIEA 122. Late Imperial Chinese Culture and Society (4)
This course surveys Chinese culture and society from the fifteenth century to the eighteenth century. We will explore the experiences of a range of political actors—emperors, scholar-officials, merchants, peasants, and women from all classes. *Prerequisites: HIEA 120 and EA 121 recommended but not required.* +

HIEA 123. Food in Chinese History (4)
This course examines the production, distribution, preparation, and consumption of food in Chinese history to illuminate such themes as state agricultural policies, regional transportation and trade networks, dynamics of social interactions and gendered divisions of labor. *Prerequisite: upper-division standing.*

HIEA 124. Science in China and the West from Ancient Times to the Seventeenth Century (4)
(Same as HISC 110.) Joseph Needham asked why a scientific revolution occurred only in early modern Europe when, until that time, the Chinese had been more successful in applying knowledge of nature to society. Examination of Needham's famous "question" and beyond. Comparative representations of the heavens, earth, and body to the arrival of the Jesuits in China. *Prerequisite: upper-division standing.* +

HIEA 127. History of Medicine in China (4)
History of medicine in Chinese society from antiquity to the present day. Medical conceptions of the human body, gender, health, geography, climate, disease, and epidemics. Change in medical institutions, ideas, publishing, practitioners, and therapies. *Prerequisite: upper-division standing.*

HIEA 130. History of the Modern Chinese Revolution: 1800–1911 (4)
This course stresses the major social, political, and intellectual problems of China in the period from the Opium War to the Revolution of 1911. Special emphasis is placed on the nature of traditional Chinese society and values, the impact of Western imperialism and popular rebellion on the traditional order, reform movements, and the origins of the early revolutionary movement.

HIEA 131. History of the Modern Chinese Revolution: 1911–1949 (4)
This course deals with the formative period of the twentieth-century Chinese revolution. Considerable stress is placed on the iconoclastic New Culture period, the rise of the student movement, Chinese communism, the labor movement, revolutionary nationalism, and the emergence of the peasant movement.

HIEA 132. History of the People's Republic of China (4)
This course analyzes the history of the PRC from 1949 to the present. Special emphasis is placed on the problem of postrevolutionary institutionalization, the role of ideology, the tension between city and countryside, Maoism, the Great Leap Forward, the Cultural Revolution.

HIEA 133. Twentieth Century China: Cultural History (4)
This course looks at how the historical problems of twentieth- century China are treated in the popular and elite cultures of the nationalist and communist eras. Special emphasis is placed on film and fiction. Knowledge of Chinese required.

HIEA 137. Women and Family in Chinese History (4)
We explore how the Confucian philosophy influenced the way the Chinese look at the family and the role of women in it, as well as the domestic lives that men and women actually led from the classical times to the present day. *Prerequisite: upper-division standing.* +

Colloquia

The following courses are available to both undergraduate and graduate students. Undergraduates must receive a departmental stamp or permission of the instructor to register for the course. Requirements for each course will differ for undergraduate, M.A., and Ph.D. students.

HIEA 160/260. Seminar in Modern Japanese History (4)
This colloquium examines controversial domestic and international issues in Japanese history from 1850 to recent times. Topics will vary from year to year. *Prerequisite: department stamp, consent of instructor.*

HIEA 161/261. Representing Japan (4)
Analyzes Anglo-American representations of Japan and "Japaneseness" from mid-nineteenth century to present. Primary focus on literary, visual, and theatrical works that have had a significant and direct impact upon popular (or public) culture and perceptions. *Prerequisite: department stamp or consent of instructor.*

HIEA 162/262. History of Women in China (4)
This course concerns women in Chinese history in Imperial times. This course will focus on women's changing roles in the family, society, and culture. Topics will vary from year to year. Requirements will vary for undergraduate, M.A., and Ph.D. students. *Prerequisite: upper-division standing.*

HIEA 164/264. Seminar in Late Imperial Chinese History (4)
Special topics in late Imperial Chinese history. Topics will vary from year to year. Requirements will vary for M.A. and Ph.D. students. Graduate students may be expected to submit a more substantial piece of work. *Prerequisite: upper-division standing or consent of instructor.* +

HIEA 167/267. Special Topics in Modern Chinese History (4)
This seminar examines controversial, domestic, and international issues in Chinese history from 1800 to recent times. *Prerequisite: department stamp or consent of instructor.*

HIEA 168/268. Topics in Classical and Medieval Chinese History (4)
This course covers specific topics in Chinese society, thought, religion, culture, and history from the Zhon through the Song dynasties. It always involves reading primary sources. *Prerequisites: upper-division standing or consent of instructor, department stamp.* +

HIEA 170/270. Colloquium on Science, Technology, and Medicine in China (4)
In this course students will examine Chinese history through writings on nature, the heavens, and the human body. The focus will be on the traditional Chinese sciences: medicine, divination, astronomy, alchemy, and geomancy. Discussion will be based on primary Chinese sources in English translation including literary, religious, philosophical, governmental, and medical texts. *Prerequisite: department stamp.*

HIEA 199. Independent Study in East Asian History (4)
Directed reading for undergraduates under the supervision of various faculty members. *Prerequisite: consent of instructor required.*

EUROPE

See History of Science for more European courses (HISC 101ABC, HISC 106)

Lecture Courses

HIEU 101. Greece in the Classical Age (4)
The social, political, and cultural history of the ancient Greek world from the Persian Wars to the death of Alexander the Great (480–323 B.C.). +

HIEU 102. The Roman Republic (4)
The political, economic, and intellectual history of the Roman world from the foundation of Rome to the time of Julius Caesar. +

HIEU 103. The Roman Empire (4)
The political, economic, and intellectual history of the Roman world from the time of Julius Caesar to the death of Justinian (A.D. 565). +

HIEU 104. Byzantine Empire (4)
A survey course of the history of the Byzantine state from the reign of Constantine to the fall of Constantinople. This course will emphasize the importance of the Byzantine state within a larger European focus, its relationship to the emerging Arab states, its political and cultural contributions to Russia and the late medieval west. +

HIEU 109. European Nationalism from a Historical Perspective (4)
An exploration of the origins, evolution, and role of nationalism in European history, from the French Revolution to the present. Nationalism has been a major force in consolidating nation-states, in creating modern identities, and in mobilizing mass movements in the modern world, and most scholars locate its birthplace in Europe. The course will provide a comparative history of nationalism as idea and political movement in each of the major European countries, as well as a more thematic analysis of scholarly approaches to the construction of nationalism and national identities. +

HIEU 110. The Rise of Europe (4)
The development of European society and culture from the decline of the Roman Empire to 1050. *Prerequisite: Humanities sequence or its equivalent.* +

HIEU 111. Europe in the Middle Ages (4)
The development of European society and culture from 1050 to 1400. *Prerequisite: Humanities sequence or its equivalent.* +

HIEU 113. Rule, Conflict, and Dissent in the Middle Ages (4)
This course explores the question of religious and political dissent in Europe from the twelfth through the fifteenth centuries. We will explore the tensions between ideal models of religious and cultural unity, and the realities of community conflict, heretical controversies, and popular uprisings. +

HIEU 115/VIS 121E. The Pursuit of the Millennium (4)
The year 2000 provokes questions about the transformation of time, culture, and society. Taking the year 1000 as a touchstone, this class examines the history of apocalyptic expectations in the Middle Ages through a close scrutiny of both texts and art. +

HIEU 120. The Renaissance in Italy (4)
The social, political, and cultural transformation of late-medieval Italy from the heyday of mercantile expansion before the plague to the dissolution of the Italian state system with the French invasions of 1494. Special focus upon family, associational life and factionalism in the city, the development of the techniques of capitalist accumulation, and the spread of humanism. *Prerequisite: upper-division standing.* +

HIEU 121. Early Modern Italy (4)
Society, politics, and culture in the Italian states from the Renaissance to the Enlightenment provide a laboratory to study the complex interaction and transformation of a wide variety of social and political systems. *Prerequisite: upper-division standing.* +

HIEU 122. Politics Italian Renaissance Style (4)
Modern political and historical thought find their roots in the realistic examination of fifteenth- and sixteenth-century Italian political experience. Contemporary Renaissance humanists and thinkers—Machiavelli, Guicciardini, Castiglione, Botero, and Campanella—tested classical, Christian, and legal models against practical necessities. +

HIEU 125. Reformation Europe (4)
The intellectual and social history of the Reformation and Counter-Reformation from the French invasions to the Edict of Nantes. Emphasis is upon reform from

below and above, the transformation of grass-roots spirituality into institutional control. *Prerequisite: upper-division standing or consent of instructor.* +

HIEU 126. Age of Expansion: Europe and the World, 1400–1600 (4)
Course will begin with a survey of the major empires of the fifteenth century, concentrating on the links between them. It will then examine the entrance of Europeans on the global scene in the sixteenth century. This part of the course will examine European/non-European encounters, focusing on perceptions, economic interaction, and institutional adaptation and will emphasize the Hispanic American, Ottoman, and Indian Ocean cases. +

HIEU 127. Sport in the Modern World (4)
This course looks at the phenomenon of sport in all of its social, cultural, political, and economic aspects. The starting point will be the emergence of modern sport in nineteenth-century Britain, but the focus will be global. Since the approach will be topical rather than chronological, students should already have a good knowledge of world history in the nineteenth and twentieth centuries. *Prerequisite: upper-division standing.*

HIEU 128. Europe Since 1945
An analysis of European history since the end of the Second World War. Focus is on political, social, economic, and cultural developments within European societies as well as on Europe's relationship with the wider world (the Cold War, decolonization).

HIEU 129. Paris, Past and Present (4)
This course surveys the historical and cultural significance of Paris from about 1500 to the present. The focus is on interactions between political, architectural, and urban evolutions, and the changing populations of Paris in times of war, revolutions, and peace. +

HIEU 130. Europe in the Eighteenth Century (4)
A lecture-discussion course focusing on Europe from 1688-1789. Emphasis is on the social, cultural, and intellectual history of France, Germany, and England. Topics considered will include family life, urban and rural production and unrest, the poor, absolutism, and the Enlightenment from Voltaire to Rousseau. Prerequisite: upper-division standing. +

HIEU 131. The French Revolution: 1789–1814 (4)
This course examines the Revolution in France and its impact in Europe and the Caribbean. Special emphasis will be given to the origins of the Revolution, the development of political and popular radicalism and symbolism from 1789 to 1794, the role of political participants (e.g., women, *sans-culottes,* Robespierre), and the legacy of revolutionary wars and the Napeoleonic system on Europe. *Prerequisite: upper-division standing.* +

HIEU 132. German Politics and Culture: 1648–1848 (4)
A lecture-discussion course on the political and cultural history of Germany in the early modern period. +

HIEU 133. Gender in Antiquity and the Early Medieval Mediterranean (4)
This course discusses sex and gender at the end of the classical period and its development into the Middle Ages in both Eastern and Western Mediterranean. Course will examine the ways in which our medieval predecessors assigned gender traits and relationships to members of society. It will approach the topic in part through an examination of the language used about gender and in part through use of modern gender theories. *Prerequisite: upper-division standing.* +

HIEU 134. The Formation of the Russian Empire, 800–1855 (4)
State-building and imperial expansion among the peoples of the East Slavic lands of Europe and Asia from the origins of the Russian state in ninth-century Kiev, through Peter the Great's empire up to the middle of the nineteenth century. *Prerequisite: upper-division standing or consent of instructor.* +

HIEU 136. The Napoleonic Era (4)
A study of the social, intellectual, military, and political currents in French history from 1799 to 1815. Special emphasis on Napoleonic France's interactions with Europe, the non-European world, women, and the military. Lectures, slides, readings, and discussions.

HIEU 136A. European Society and Social Thought, 1688–1870 (4)
A lecture and discussion course on European political and cultural development and social theory from 1688-1870. Important writings will be considered both as responses to and as provocations for political and cultural change. +

HIEU 136B. European Society and Social Thought, 1870–1989 (4)
A lecture and discussion course on European political and cultural development and theory from 1870–1989. Important writings will be considered both as responses to and as provocations for political and cultural change.

HIEU 138. Imperial Spain, 1476–1808 (4)
The rise and decline of Spain's European empire from Ferdinand and Isabella to 1700. The revival of Spain and her return to European affairs in the eighteenth century. *Prerequisite: upper-division standing or graduate standing.* +

HIEU 139. The Origins of Constitutions (4)
The course will cover the development of constitutional ideas and institutions from the twelfth century to the U.S. Constitution. Students will read legal texts and commentaries that established the foundations of the ideas of the rule of law, limited government, inalienable rights, and the independent judiciary. Students will study the formation of institutions such as parliament, the court system, and common law. The course will start and finish with an analysis of the U.S. Constitution. *Prerequisite: upper-division standing or consent of instructor.* +

HIEU 141. European Diplomatic History, 1870–1945 (4)
European imperialism, alliances, and the outbreak of the First World War. The postwar settlement and its breakdown. The advent of Hitler and the disarray of the western democracies. The Second World War and the emergence of the super powers.

HIEU 142. European Intellectual History, 1780–1870 (4)
European thought from the late Enlightenment and the French Revolution to Marx and Baudelaire, emphasizing the origins of romanticism, idealism, and positivism in England, Germany, and France. *Prerequisite: upper-division standing or consent of instructor.*

HIEU 143. European Intellectual History, 1870–1945 (4)
A lecture-discussion course on the crisis of bourgeois culture, the redefinition of Marxist ideology, and the transformation of modern social theory. Readings will include Nietzsche, Sorel, Weber, Freud, and Musil. (This course satisfies the minor in the Humanities Program.) *Prerequisite: upper-division standing.*

HIEU 146. Fascism, Communism, and the Crisis of Liberal Democracy: Europe 1919–1945 (4)
A consideration of the political, social, and cultural crisis that faced Western liberal democracies in the interwar period, with emphasis on the mass movements that opposed bourgeois liberalism from both the left and the right.

HIEU 147. The History of Women in Europe: Middle Ages to the Early Modern Era (4)
This course explores shifts in the roles and representations of women from the early middle ages, through the Renaissance and Reformation, and up to the seventeenth century. Topics will be examined across the European social order and include gender and sexuality, holy women, religious movements, and production and reproduction. *Prerequisite: upper-division standing.* +

HIEU 148. European Women: the Enlightenment to the Victorian Era (4)
This course explores shifts in the roles and representations of women from the late seventeenth century to about 1870. Topics are examined across the European social order and include: gender and sexuality, women writers and print culture, women's participation in the French and industrial revolutions, and the emergence of feminist movements. *Prerequisite: upper-division standing or consent of instructor.* +

HIEU 149. History of Women in Europe: 1870 to the Present (4)
This course explores the history of women across classes from 1870 to the present, with an emphasis on the variety of women's experience and the efforts towards and obstacles to empowerment. Topics include: women and the state, science and gender, feminist movements and the evolution of women's work. *Prerequisite: upper-division standing.*

HIEU 150. Modern British History (4)
Emphasis on changes in social structure and corresponding shifts in political power. The expansion and the end of empire. Two World Wars and the erosion of economic leadership. *Prerequisite: upper-division standing or consent of instructor.*

HIEU 151. Spain since 1808 (4)
Social, political, cultural history of Spain since Napoleon. Features second Spanish Republic, the Civil War, Franco era, and transition to democracy. *Prerequisite: upper-division standing.*

HIEU 153A. Nineteenth-Century France (4)
A study of the social, intellectual, and political currents in French history from the Revolution of 1789 to the eve of the First World War. Lectures, slides, films, readings, and discussions.

HIEU 154. Modem German History: From Bismarck to Hitler (4)
An analysis of the volatile course of German history from unification to the collapse of the Nazi dictatorship. Focus is on domestic developments inside Germany as well as on their impact on European and global politics in the twentieth century.

HIEU 155. Modern Austria (4)
The political, social, and intellectual history of Austria from Maria Theresa to the First Republic with special emphasis on the crisis of liberal culture in the late nineteenth century. *Prerequisite: upper-division standing or consent of instructor.*

HIEU 156. The Russian Empire and the Soviet Union, 1855–1991 (4)
War, revolution, development, and terror in the multinational empires of the nineteenth and twentieth centuries. *Prerequisite: upper-division standing or consent of instructor.*

Colloquia

The following courses are available to both undergraduate and graduate students. Undergraduates must receive a departmental stamp or permission of the instructor to register for the course. Requirements for each course will differ for undergraduate, M.A., and Ph.D. students.

HIEU 160/260. Topics in the History of Greece (4)
A seminar focusing on selected topics in Greek history from the Bronze Age to the Roman Conquest. *Prerequisite: upper-division standing or consent of instructor.* +

HIEU 161/261. Topics in Roman History (4)
A seminar focusing on selected topics in Roman history and culture from the period of the Kings to the later Roman Empire. *Prerequisite: upper-division or graduate standing or consent of instructor.* +

HIEU 163/263. Special Topics in Medieval History (4)
Intensive study of special problems or periods in the history of medieval Europe. Topics vary from year to year, and students may therefore repeat the course for credit. *Prerequisites: background in European history and upper-division standing.* +

HIEU 165/265. Special Topics in Early Modern Spain (4)
Readings and discussion of recent studies on Spain in the early modern period: the Hapsburg Empire to 1700, social and economic conditions of Spain in the Enlightenment of the eighteenth century, and the breakup of the Old Regime after 1790. *Prerequisite: background in European history.* +

HIEU 167/267. Special Topics in the Social History of Early Modern Europe (4)
Topic varies from year to year. May be repeated for credit. *Prerequisite: upper-division or graduate standing.* +

HIEU 171/271. Special Topics in Twentieth-Century Europe (4)
This course alternates with HIEU 170. Topics will vary from year to year. *Prerequisite: background in European history.*

HIEU 172/272. War in the Twentieth Century (4)
Reckonings by novelists, essayists, and biographers with the phenomenon of contemporary warfare as an unprecedented experience and an abiding threat. *Prerequisite: upper-division standing or consent of instructor.*

HIEU 174/274. The Holocaust: A Psychological Approach (4)
An examination of how traditional moral concerns and human compassion came to be abandoned and how the mass murder of the Jews was organized and carried out. The focus of this course will be on the perpetrators. Requirements will vary for undergraduate M.A. and Ph.D. students. Graduate students are required to submit a more substantial piece of work. *Prerequisites: upper-division or consent of instructor. Department stamp required.*

HIEU 175/275. Selected Topics in the History of Nineteenth- and Twentieth-Century Spain (4)
Topics may include economic development, modernization, political change, intellectual history, and the transition to democracy. *Prerequisite: upper-division standing or consent of instructor.*

HIEU 177/277. Special Topics in Modern German Thought (4)
Topics will vary from year to year. (Satisfies the Humanities Program minor.) *Prerequisite: background in European history.*

HIEU 177A/277A. The Two Germanys Since 1945
An analysis of the parallel and divergent paths of East and West Germany since 1945. Focus is on the close interrelationship between both postwar societies as well as on the origins of the East German revolution and unification in 1989–90. *Prerequisite: upper-division standing or consent of instructor.*

HIEU 178/278. Topics in Russian History and Popular Culture (4)
Topics will vary from year to year. Graduate students are required to submit a more substantial paper. *Prerequisite: upper-division standing or consent of instructor.*

HIEU 180/280. Topics in European Women's History (4)
The specific content of the course will vary from year to year, but will always analyze in depth a limited number of issues in European women's history. *Prerequisite: upper-division standing or consent of instructor.*

HIEU 199. Independent Study in European History (4)
Directed readings for undergraduates under the supervision of various faculty members. *Prerequisite: consent of instructor.*

LATIN AMERICA

Lecture Courses

HILA 100. Latin America–Colonial Transformations (4)
Lecture-discussion survey of Latin America from the pre-Columbian era to 1825. It addresses such issues as the nature of indigenous cultures, the implanting of colonial institutions, native resistance and adaptations, late colonial growth and the onset of independence. +

HILA 101. Latin America: The Construction of Independence 1810–1898 (4)
Lecture-discussion survey of Latin America in the nineteenth century. It addresses such issues as the collapse of colonial practices in the society and economy as well as the creation of national governments, political instability, disparities among regions within particular countries, and of economies oriented toward the export of goods to Europe and the United States.

HILA 102. Latin America in the Twentieth Century (4)
This course surveys the history of the region by focusing on two interrelated phenomena: the absence of democracy in most nations and the region's economic dependence on more advanced countries, especially the United States. Among the topics discussed will be the Mexican Revolution, the military in politics, labor movements, the wars in Central America, liberation theology, and the current debt crisis. *Prerequisite: upper-division standing or consent of instructor.*

HILA 103. Revolution in Modern Latin America
A political, economic, and social examination of the causes and consequences of the Mexican, Cuban, and Nicaraguan revolutions. Also examine guerrilla movements that failed to gain power in their respective countries, namely the Shinning Path in Peru, FARC in Colombia, and the Zapatistas in Mexico. *Prerequisite: upper-division standing.*

HILA 104. Modern U.S.-Latin American Relations
A survey of inter-American relations during the twentieth century. Emphasis will be placed on U.S. territorial and economic expansion, U.S. national-security and ideological morality, and Latin American efforts to influence U.S. policy in order to strengthen, in most cases, elite domination of society. *Prerequisite: upper-division standing.*

HILA 108. Economic History: Continuity and Change in Latin America (4)
Main economic processes in Latin America, from colonial times to the twenty-first century, to understand what has been called the "colonial heritage" role played by economic actors, including the state and foreign capital, and will read Latin America's development in a comparative perspective. Main theoretical propositions to understand patterns of development. No training in economics or statistics is required. *Prerequisite: upper-division standing.*

HILA 112. Economic and Social History of the Andean Region (4)
Study of the economic and social problems of the Andean region from the colonial period until the crisis of 1912, with special attention to theoretical models to explain the processes of change. *Prerequisite: upper-division standing.*

HILA 115. The Latin American City, a History (4)
A survey of the development of urban forms of Latin America and of the role that cities played in the region as administrative and economic centers. After a brief survey of pre-Columbian centers, the lectures will trace the development of cities as outposts of the Iberian empires and as "city-states" that formed the nuclei of new nations after 1810. The course concentrates primarily on the cities of South America, but some references will be made to Mexico City. It ends with a discussion of modern social ills and Third World urbanization. Lima, Santiago de Chile, Buenos Aires, Rio de Janeiro, and Sao Paulo are its principal examples. *Prerequisite: upper-division standing.*

HILA 120. History of Argentina (4)
A survey from the colonial period to the present, with an emphasis on the nineteenth and twentieth centuries. Among the topics covered: the expansion of the frontier, the creation of a cosmopolitan, predominately European culture, and the failure of industrialization to provide an economic basis for democracy. *Prerequisite: upper-division standing.*

HILA 121. History of Brazil (4)
From colonial times to the present, with an emphasis on the nineteenth and twentieth centuries. Among the topics covered: the evolution of a slave-based economy, the key differences among regions, the military in politics, and the creation of the most populous and industrialized country in Latin America. *Prerequisite: upper-division standing.*

HILA 122. Cuba: From Colony to Socialist Republic
A lecture-discussion course on the historical roots of revolutionary Cuba, with special emphasis on the impact of the United States on the island's development and society. *Prerequisite: upper-division standing.*

HILA 123. The Incas and Their Ancestors (4)
The Incas called their realm Tahuantinsuyu (Land of the Four Quarters). But the Incas were only one of the many ethnic groups in the Andean region. Many different other groups became a part of the Tahuantinsuyu in the wake of Inca expansion. Over the past decade new and fascinating information on these processes have been published, and allows for a re-reading of Inca history between 900 and 1535. +

HILA 131. A History of Mexico (4)
A century of Mexican history, 1821-1924: the quest for political unity and economic solvency, the forging of a nationality, the Gilded Age and aftermath, the ambivalent Revolution of Zapata and his enemies. *Prerequisite: upper-division standing or consent of instructor.*

HILA 132. A History of Contemporary Mexico (4)
The paradox of a conservative state as heir to a legendary social upheaval, with special emphasis on the mural art renaissance, the school crusade, the economic dilemma, and the failure to eradicate poverty and inequality. Lectures and discussion. *Prerequisite: upper-division standing or consent of instructor.*

Colloquia

The following courses are available to both undergraduate and graduate students. Undergraduates must receive a departmental stamp or permission of the instructor to register for the course. Requirements for each course will differ for undergraduate, M.A., and Ph.D. students.

HILA 161/261. History of Women in Latin America (4)
A broad historical overview of Hispanic-American women's history focusing on issues of gender, sexuality, and the family as they relate to women, as well as the historiographical issues in Latin American and Chicana women's history. *Prerequisites: upper-division standing and consent of instructor.*

HILA 162/262. Special Topics in Latin American History (4)
Topics will vary from year to year or quarter to quarter. May be repeated for an infinite number of times due to the nature of the content of the course always changing. *Prerequisite: upper-division standing or consent of instructor.*

HILA 163/263. The History of Chile 1880–Present (4)
The course surveys Chile's basic developments beginning with the era of nitrate exports. Students will have the opportunity to address a specific issue of his/her own choosing and develop the topic for class presentation and a final paper. Graduate students are expected to submit a more substantial piece of work. *Prerequisite: upper-division standing or consent of instructor.*

HILA 170/270. Topics in Latin American History, 1820–1910
Topics may vary from year to year. May be repeated for credit. Requirements will vary for undergraduate, M.A., and Ph.D. students. Graduate students must be required to submit a more substantial piece of work. *Prerequisite: upper-division or graduate standing.*

HILA 171/271. Topics in Latin American History 1910
Topics may vary from year to year. May be repeated for credit. Requirements will vary for undergraduates, M.A., and Ph.D. students. Graduate students must be required to submit a more substantial piece of work. *Prerequisite: upper-division or graduate standing.*

HILA 199. Independent Study in Latin American History (4)
Directed readings for undergraduates under the supervision of various faculty members. *Prerequisite: consent of instructor and department stamp.*

NEAR EAST

Lecture Courses

HINE 100. The Ancient Near East and Israel (4)
Introduction to the history and literature of ancient Israel, from c.1200 B.C.E. to c. 500 B.C.E. Reading from the Bible, historical and archaeological surveys, and studies of authorship. +

HINE 102. The Jews in Their Homeland in Antiquity (4)
The Jews in Israel from the sixth century BCE to the seventh century CE. Statehood, nationalism, and autonomy within the framework of the Persian empire, the Hellenistic kingdoms, and the Roman-Byzantine empire. Cultural and religious developments will be explored. *Prerequisite: upper-division standing.* +

HINE 105. The Bible and the Near East: The Prophets (4)
This course covers the four books of the Latter Prophets, including the three major prophets, Isaiah, Ezekiel, and Jeremiah, and the twelve minor prophets. +

HINE 106. The Bible and the Near East: The Writings (4)
This course covers the books of the Hebrew Bible not covered in HINE 104 and HINE 105. It will include Psalms, Proverbs, Job, the Megillot, Daniel, and the Chronicler's Work. +

HINE 108. The Middle East before Islam (4)
The peoples, politics, and cultures of Southwest Asia and Egypt from the sixth century B.C.E. to the seventh century C.E. The Achemenid Empire, the Ptolemaic and Seleucid kingdoms, the Roman Orient, the Parthian and Sasanian states. *Prerequisite: upper-division standing.* +

HINE 109. Learning to Read Biblical Hebrew
Inculcation of the linguistic and grammatical knowledge needed to understand the Hebrew Bible in its original tongue. Emphasis is placed on acquiring a basic vocabulary, mastering fundamentals of grammar, and practice at reading. No previous knowledge of Hebrew is required. +

HINE 114. History of the Islamic Middle East
A survey of the Middle East from the rise of Islam to the region's economic, political, and cultural integration into the West (mid-nineteenth century). Emphasis on socioeconomic and political change in the early Arab empires and the Ottoman state. +

HINE 118. The Middle East in the Twentieth Century (4)
An introduction to the history of the Middle East since 1914. Themes such as nationalism, imperialism, the oil revolution, and religious revivalism will be treated within a broad chronological and comparative framework drawing on the experience of selected countries.

HINE 151A/251A. Introduction to Aramaic Language (4)
General introduction to Aramaic dialects, intense study of Targumic Aramaic. *Prerequisites: knowledge of Hebrew alphabet; acquaintance with a cognate Semitic language highly desirable.* +

HINE 151B/251B. Introduction to Aramaic Dialects (4)
Study of Ancient Inscriptional Persian Imperial and Syriac Aramaic. +

HINE 151C/251C. Introduction to Aramaic Dialects (4)
Study of Qumran and Babylonian Talmudic Aramaic. +

HINE 152A/252A. The Evolution of the Northwest Semitic Dialects (4)
Priciples of historical linguistics, application to the languages of the ancient Levant. *Prerequisites: knowledge of at least one Semitic language; a course in general linguistics is also desirable.* +

HINE 152B/252B. Introduction to Ugaritic (4)
Decipherment of Ugaritic tablets, history, and culture of ancient Ugarit, study of Ugaritic mythic texts. +

HINE 152C/252C. Advanced Ugaritic (4)
Continued study of Ugaritic literature, comparison with Canaanite inscriptions. +

HINE 153A/253A. Introduction to Akkadian Language and Mesopotamian Culture (4)
Students study cuneiform script and elements of Babylonian-Assyrian grammar, as well as the history of Ancient Mesopotamia. +

HINE 153B/253B. Continued Akkadian Language (4)
Student begin to read and analyze ancient Mesopotamian texts from a variety of genres. +

HINE 153C/253C. Advanced Akkadian Language (4)
Continued study of Mesopotamia literature and history. +

Colloquia

The following courses are available to both undergraduate and graduate students. Undergraduates must receive a departmental stamp or permission of the instructor to register for the course. Requirements for each course will differ for undergraduate, M.A., and Ph.D. students.

HINE 161/HINE 261. Seminar in the Hebrew Bible (4)
Systematic reading and rendering of the books of the Hebrew Bible in order. Each time the class is taught, we will look at a different book. Adequate knowledge of Biblical Hebrew is required. Graduate students will have to write an extra paper or exam. *Prerequisites: Judiac Studies 103, graduate standing, or consent of instructor.* +

HINE 166/266. Nationalism in the Middle East (4)
Growth of nationalism in relation to imperialism, religion, and revolution in the nineteenth- and twentieth-century Middle East. Emergence of cultural and political ethnic consciousness in the Ottoman state. Comparative study of Arab, Iranian, and Turkish nationalism as well as Zionism. *Prerequisite: department stamp or consent of instructor.*

HINE 170/270. Special Topics in Jewish History (4)
This course studies a period or theme in Jewish history. Topics will vary from year to year. *Prerequisite: department stamp required.*

HINE 181/281. Problems in the Study of Hebrew Manuscripts (4)
Detailed study of a portion of biblical text. Focus on text-critical and source-critical problems. *Prerequisite: upper-division or graduate standing.* +

HINE 186/286. Special Topics in Middle Eastern History (4)
Focused study of historical roots of contemporary problems in the Middle East: Islamic modernism and Islamist movements; contacts with the West; ethnic and religious minorities; role of the military; economic resources and development. *Department stamp and permission of instructor.*

HINE 199. Independent Study in Near Eastern History (4)
Directed readings for undergraduates under the supervision of various faculty members. *Prerequisite: consent of instructor.*

HISTORY OF RELIGION

HIRE 120. Buddhist Thought and Practice (4)
An introduction to the Buddhist religion, with attention to its moral and philosophical teachings, its modes of practice (e.g. meditation, ritual), and its social and institutional contexts. The course takes a historical approach, concentrating on the traditions as they developed within India.

HISTORY OF SCIENCE

Lecture Courses

HISC 100. The Discovery of Deep Time (4)
The discovery of the vast scale of the past history of the natural world, and the consequent dwarfing of human history, from the chronologies of the seventeenth century, through the emergence of the science of geology, to the planetary histories of the twentieth century.

HISC 101A. Science in the Greek and Roman World (4)
A survey of the principal features of ancient science: the origins of Greek naturalism, the criticism of magic, notions of quantification. Topics may include astronomy, astrology, geography, geometry, optics, mechanics and physical theory, classification of living beings, and human cognition. Emphasis on primary sources, such as the presocratic natural philosophers: Plato, Artistotle, Euclid, Archimedes, Ptolemy, Pliny Galen, and Proclus. *Prerequisite: upper-division standing.* +

HISC 101B. Medieval Science in the Latin West, ca. 500–1500 (4)
Styles of the medieval scientific imagination. Reception and assimilation of the learning of the ancient world, especially Aristotle, Plato, Euclid, Galen, and Ptolemy. Struggles to reconcile Greek, Arabic, and Christian ideals of knowledge. Rise of universities. Natural philosophy, logic, geometry, optics, astronomy, astrology, mechanics, geography, and classification of living beings. *Prerequisite: upper-division standing.* +

HISC 101C. Early Modern Science (4)
Early forms of modern science, mid-15th to 17th centuries. The revolution in printing. Sites of knowledge-making: university and court cultures, museums, academies. Astrology, astronomy, literature of the heavens, prophecy and apocalyptic expectation. Natural history, medicine, alchemy, magic and the physico-mathematical sciences. *Prerequisite: upper-division standing.* +

HISC 103. Gender and Science in Historical Perspective (4)
History of women's struggles and strategies for access and equality in professional science. Questions related to gender bias in science—as a social institution and as an epistemological enterprise—will be addressed in light of the historical and biographical readings. *Prerequisite: upper-division standing.*

HISC 104. History of Popular Science (4)
Historical aspects of the popularization of science. The changing relation between expert science and popular understanding. The reciprocal impact of scientific discoveries and theories, and popular conceptions of the natural world. *Prerequisite: upper-division standing.*

HISC 105. History of Environmentalism (4)
History of human effects on the natural environment, and with environmentalist interpretations of the history of science.

HISC 106. The Scientific Revolution (4)
A cultural history of the formation of early modern science in the sixteenth and seventeenth centuries: the social forms of scientific life; the construction and meaning of the new cosmologies from Copernicus to Newton; the science of politics and the politics of science; the origins of experimental practice; how Sir Isaac Newton restored law and order to the West. *Prerequisite: upper-division standing.* +

HISC 107. The Emergence of Modern Science
The development of the modern conception of the sciences, and of the modern social and institutional structure of scientific activity, chiefly in Europe, during the eighteenth and nineteenth centuries. *Prerequisite: upper-division standing.*

HISC 108. Science in the Twentieth Century (4)
Major intellectual developments in twentieth-century science, including quantum mechanics and relativity, molecular biology and DNA, and plate tectonics. Emphasis on the sources of new ideas and evidence in science, and the forging of consensus in scientific communities. *Prerequisite: upper-division standing.*

HISC 111. Origins of the Atomic Age (4)
The atomic bomb changed the world. We examine the origins and impact of the atomic age: the discovery of radioactivity; the Manhattan project and bombings of Hiroshima and Nagasaki; the H-bomb, nuclear fallout, and the modern environmental movement. *Prerequisite: upper-division standing or consent of instructor.*

HISC 114. The Darwinian Legacy (4)
The Origin of Species by means of Natural Selection, and its scientific, intellectual, and political legacies. Topics include social Darwinism, eugenics, Nazi racial hygiene, population control, neo-Malthusianism in the modern environmental movement. *Prerequisite: upper-division standing.*

HISC 130. Technology in the Twentieth Century (4)
Major technological developments in the twentieth century, including the rise and decline of technologies, unexpected hazards and unanticipated consequences, and why some technologies fail. *Prerequisite: upper-division standing.*

Colloquia

The following courses are available to both undergraduate and graduate students. Undergraduates must receive a departmental stamp or permission of the instructor to register for the course. Requirements for each course will differ for undergraduate, M.A., and Ph.D. students.

HISC 160/260. Historical Approaches to the Study of Science (4)
Major recent publications in the history of science will be discussed and analyzed; the topics will range in period from the seventeenth century to the twentieth, and will deal with all major branches of natural science. Special topics. Topics will vary from year to year. *Prerequisite: consent of instructor.*

HISC 162/262. Problems in the History of Science and Religion (4)
Intensive study of specific problems in the relation between science and religion. The problems may range in period from the Renaissance to the twentieth century. Topics vary from year to year, and students may therefore repeat the course for credit. *Prerequisite: upper-division standing.*

HISC 164/264. Topics in the History of the Physical Sciences
Intensive study of specific problems in the physical (including chemical and mathematical) sciences, ranging in period from the Renaissance to the twentieth century. Topics vary from year to year, and students may therefore repeat the course for credit.

HISC 165/265. Topics in 20th Century Science and Culture
This is a seminar open to advanced undergraduates and graduate students, which explores topics at the interface of science, technology, and culture, from the late nineteenth century to the present. Topics change yearly; may be repeated for credit with instructor's permission. Requirements vary for undergraduates, M.A. and Ph.D. students. Graduate students are required to submit a more substantial piece of work. *Prerequisite: upper-division standing or consent of instructor.*

HISC 166/266. The Galileo Affair (4)
Galileo's condemnation by the Catholic Church in 1633 is a well-known but misunderstood episode. Was Galileo punished for holding dangerous scientific views? Personal arrogance? Disobedience? Religious transgressions? Readings in original sources, recent historical interpretations. Graduate students will be expected to submit a more substantial piece of work. +

HISC 167/267. Gender and Science (4)
Why have women been traditionally excluded from science? How has this affected scientific knowledge? How have scientists constructed gendered representations not only of women, but also of science and nature? We will address these questions from perspectives including history, philosophy, and psychoanalytic theory. *Prerequisite: upper-division standing or consent of instructor.*

HISC 168/268. The Extraterrestrial Life Question (4)
The changing fortunes of the belief in the existence of life beyond the Earth (pluralism) from 1750–present as it evolved from a marginal speculation to a central scientific question with wide-ranging consequences for traditional religious belief-systems. Graduate students will be expected to submit a more substantial piece of work. *Prerequisite: upper-division or graduate standing or consent of instructor.*

HISC 199. Independent Study in the History of Science (4)
Directed readings for undergraduates under the supervision of various faculty members. *Prerequisite: consent of instructor.*

UNITED STATES

See History of Science for more U.S. courses (HISC 105, HISC 108, HISC 111)

Lecture Courses

HIUS 100. Colonial Period to 1763 (4)
Political and social history of the thirteen colonies: European background, settlement and expansion, beginnings of culture, and the imperial context. *Prerequisite: upper-division standing.* +

HIUS 101. The American Revolution (4)
Causes and consequences of the revolution: intellectual and social change, the problems of the new nation, the Constitution, and the origins of political parties. *Prerequisite: upper-division standing.* +

HIUS 102. The Age of Encounters, 1492–1630 (4)
Europeans, Native Americans, and Africans in North America from Columbus' first voyage to early English colonization. Emphasis on cultural, political, and ecological consequences of contact. Topics include the Spanish Conquest, the origins of the African slave trade, Iroquois-French commerce, and the early history of California. +

HIUS 105. Thomas Jefferson and Early American History (4)
This course will study Thomas Jefferson, both as an influential American in his own right and as a window onto the age of the American Revolution, the Enlightenment, and the early American Republic. Students will read both biographical materials and original documents to address various aspects of Jefferson's life and times. *Prerequisite: upper-division standing.* +

HIUS 107. The Early Republic (4)
This course will examine the transformation of American society and politics between the American Revolution and the Jacksonian period. Topics to be considered include the emergence of domesticity, the development of political parties, the expansion of capitalist relations, the debate over slavery, the early labor movement, and the origins and motivations of middle-class reform. +

HIUS 108/ETHN 112. History of Native Americans in the United States
This course examines the history of Native Americans in the United States, with emphasis on the lifeways, mores, warfare, and relations with the United States government. Attention is given to the background and evolution of acculturation up to the present day. *Prerequisite: upper-division standing.*

HIUS 114. California History (4)
This course examines California history from 1800 onward, with an emphasis on social, economic, and political change. The course will explore the effect of national and international events as well as the ways in which California–the ideal and the real–shapes the American experience.

HIUS 115. History of Sexuality in the United States
Constructions of sex and sexuality in the United States from the time of pre-contact Native America to the present, focusing on sexual behaviors, sexual ideologies, and the uses of sexuality for social control.

HIUS 116. War and American Society (4)
The connection between social relations and America's wars. Ways that American society has influenced decisions to prepare for or go to war as well as the impact of war on class relations and ideologies of race and gender. Wars considered will include the Revolutionary and Civil Wars, the two World Wars, and Korea and Vietnam. *Prerequisite: upper-division standing.*

HIUS 117. History of Los Angeles (4)
This course examines the history of Los Angeles from the early nineteenth century to the present. Particular issues to be addressed include urbanization, ethnicity, politics, technological change, and cultural diversification.

HIUS 122. History and Hollywood: America and the Movies Since the Great Depression (4)
A lecture-discussion course utilizing written texts and films to explore major themes in American politics and culture from the Great Depression through the 1990s. Topics will include the wars of America, McCarthyism, the counter-culture of the 1960s, and the transformation of race and gender relations. *Prerequisite: upper-division standing or consent of instructor.*

HIUS 124/ETHN 125. Asian American History
Explore how Asian Americans were involved in the political, economic, and cultural formation of United States society. Topics include migration; labor systems; gender, sexuality and social organization; racial ideologies and anti-Asian movements; and nationalism and debates over citizenship.

HIUS 131. Cultural History from the Civil War to the Present (4)
This course will focus on the transformation of work and leisure and the development of consumer culture. Students will consider connections between culture, class relations, gender ideology, and politics. Topics will include labor radicalism, Taylorism, the development of organized sports, the rise of department stores, the transformation of middle-class sexual morality, the growth of commercial entertainment, and the culture of the cold war.

HIUS 134. Art and Society in America
The evolution and interaction of American art and society from the colonial period to the early twentieth century.

HIUS 135A/ETHN 170A. Origins of the Atlantic World, c. 1450–1650 (4)
An examination of interactions among the peoples of western Europe, Africa, and the Americas that transformed the Atlantic basin into an interconnected "Atlantic World." Topics will include maritime technology and the European Age of Discovery, colonization in the Americas, the beginnings of the transatlantic slave trade and the early development of plantation slavery in the New World. *Prerequisite: upper-division standing or consent of instructor.* +

HIUS 135B/ETHN 170B. Slavery and the Atlantic World (4)
The development of the Atlantic slave trade and the spread of racial slavery in the Americas before 1800. Explores the diversity of slave labor in the Americas and the different slave cultures African Americans produced under the constraints of slavery. *Prerequisite: upper-division standing or consent of instructor.* +

HIUS 137. The Built Environment in the Twentieth Century
An examination of urban and regional planning as well as piecemeal change in the built environment. Topics include urban and suburban housing, work environments, public spaces, transportation and utility infrastructures, utopianism. *Prerequisite: consent of instructor.*

HIUS 138/ETHN 167. African-American History in War and Peace: 1917 to the Present (4)
The social, political, economic, and ideological pressures generated during the international conflicts of the twentieth century have had an enormous impact on American life. The course examines how the pressures of "total war" and "cold war" shaped the African-American experience in both war and peacetime. *Prerequisite: upper-division standing or consent of instructor.*

HIUS 139/ETHN 149. African-American History in the Twentieth Century (4)
This course examines the transformation of African America across the expanse of the long twentieth century: imperialism, migration, urbanization, desegregation, and deindustrialization. Special emphasis will be placed on issues of culture, international relations, and urban politics. *Prerequisite: upper-division standing.*

HIUS 140/ECON 158A. Economic History of the United States I (4)
The United States as a raw materials producer, as an agrarian society, and as an industrial nation. Emphasis on the logic of the growth process, the social and political tensions accompanying expansion, and nineteenth- and early twentieth-century transformations of American capitalism.

HIUS 141/ECON 158B. Economic History of the United States II (4)
The United States as modern industrial nation. Emphasis on the logic of the growth process, the social and political tensions accompanying expansion, and twentieth-century transformations of American capitalism.

HIUS 147. History of the American Suburb (4)
This lecture explores the development of suburbs in America, from the early nineteenth century to the contemporary era. Topics include suburban formation, class, ethnic and racial dimensions, government influences, social life, and cultural responses to suburbia. The class will explore competing theories of suburbanization as it surveys the major literature.

HIUS 148/USP 103. The American City in the Twentieth Century (4)
This course focuses on the phenomenon of modern American urbanization. Case studies of individual cities will help illustrate the social, political, and environmental consequences of rapid urban expansion, as well as the ways in which urban problems have been dealt with historically.

HIUS 149. The United States in the 1960s (4)
An overview of the social and political developments that polarized American society in the tumultuous decade of the 1960s. Themes include the social impact of the post-war "baby boom," the domestic and foreign policy implications of the Cold War; the evolution of the civil rights and women's movements; and the transformation of American popular culture.

HIUS 150. American Legal History to 1865 (4)
The history of American law and legal institutions. This quarter focuses on crime and punishment in the colonial era, the emergence of theories of popular sovereignty, the forging of the Constitution and American federalism, the relationship between law and economic change, and the crisis of slavery and Union. *Prerequisite: upper-division standing.*

HIUS 151. American Legal History since 1865 (4)
The history of American law and legal institutions. This course examines race relations and law, the rise of big business, the origins of the modern welfare state during the Great Depression, the crisis of civil liberties produced by two world wars and McCarthyism, and the Constitutional revolution wrought by the Warren Court. HIUS 150 is not a prerequisite for HIUS 151. *Prerequisite: upper-division standing.*

HIUS 152A. A Constitutional History of the United States to 1865 (4)
The historical development of constitutional thought and practice in the United States from the era of the American Revolution through the Civil War, with special attention to the role of the Supreme Court under Chief Justices Marshall and Taney. *Prerequisite: upper-division standing or consent of instructor.*

HIUS 152B. A Constitutional History of the United States Since 1865 (4)
The historical development of constitutional thought and practice in the United States since 1865, with special attention to the role of the Supreme Court from Chief Justices Chase to Renquist. *Prerequisite: upper-division standing or consent of instructor.*

HIUS 153. American Political Trials (4)
Survey of politicized criminal trials and impeachments from Colonial times to the 1880s. Examines politically-motived prosecutions and trials that became subjects of political controversy, were exploited by defendants for political purposes, or had their outcomes determined by political considerations. +

HIUS 154. Western Environmental History (4)
This course examines human interaction with the western American environment and explores the distinction between the objective environmental understanding of science and the subjective views of history and historians. The course will also analyze the most compelling environmental issues in the contemporary West.

HIUS 155A. Religion and Law in American History: Foundations to the Civil War (4)
Selected problems in the history of the relationship between religious beliefs and practice and legal institutions in the Anglo-American world. Topics include the English background, religion in the age of the American Revolution and the antebellum period. *Prerequisite: upper-division standing or consent of instructor.* +

HIUS 155B. Religion and Law in American History: Civil War to the Present (4)
Selected problems in the history of the relationship between religious beliefs and practice and legal institutions in America from the Civil War to the present. Topics include the religion and government aid; sacred duties and the law; and religion and cultural politics. *Prerequisite: upper-division standing or consent of instructor.*

HIUS 156. American Women, American Womanhood (4)
This course explores the emergence of a dominant ideology of womanhood in America in the early nineteenth century and contrasts the ideal with the historically diverse experience of women of different races and classes, from settlement to 1870. Topics include witchcraft, evangelicalism, cult of domesticity, sexuality, rise of industrial capitalism and the transformation of women's work, Civil War, and the first feminist movement. *Prerequisite: upper-division standing.* +

HIUS 157. American Women, American Womanhood 1870 to Present
This course explores the making of the ideology of womanhood in modern America and the diversity of American women's experience from 1870 to the present. Topics include the suffrage movement, the struggle for reproductive rights and the ERA; immigrant and working-class women, women's work, and labor organization; education, the modern feminist movement and the contemporary politics of reproduction, including abortion and surrogate motherhood. *Prerequisite: upper-division standing.*

HIUS 158/ETHN 130. Social and Economic History of the Southwest I (4)
This course examines the history of the Spanish and Mexican borderlands (what became the U.S. Southwest) from roughly 1400 to the end of the U.S.-Mexico War in 1848, focusing specifically on the area's social, cultural, and political development. +

HIUS 159/ETHN 131. Social and Economic History of the Southwest II (4)
(Cross-listed as Ethnic Studies 131.) This course examines the history of the Amnerican Southwest from the U.S.-Mexican War in 1846-48 to the present, focusing on immigration, racial and ethnic conflict, and the growth of Chicano national identity.

Colloquia

The following courses are available to both undergraduate and graduate students. Undergraduates must receive a departmental stamp or permission of the instructor to register for the course. Requirements for each course will differ for undergraduate, M.A., and Ph.D. students.

HIUS 162/262. The American West (4)
This seminar will trace major themes in the history of the American West. Topics will include ethnicity, the environment, urbanization, demographics, and shifting concepts surrounding the significance of the West. Graduate students will be required to submit additional work in order to receive graduate credit for the course. *Prerequisite: department stamp required.*

HIUS 164/264/ETHN 181. Topics in Comparative History of Modern Slavery (4)
Slavery was both a thread of continuity in the history of the Americas and a distinctive institution in specific social settings. The purpose of this course is to examine and discuss readings that explore topics of the Caribbean and the United States. Because topics will vary, the seminar may be taken more than once for credit, with consent of the instructor. Requirements vary for undergraduates, M.A., and Ph.D. students. Graduate students are required to submit a more substantial piece of work. *Prerequisite: upper-division standing or consent of instructor.*

HIUS 165/ETHN 182. Segregation, Freedom Movements, and the Crisis of the Twentieth Century (4)
A reading and discussion seminar that views the origins of segregation and the social movements that challenged it between 1890 and 1970 in comparative framework. *Prerequisite: upper-division standing.*

HIUS 166/266. Topics in Southern History (4)
Specific topics will vary from year to year, including slavery, Civil War and Reconstruction, the Afro-American experience, race relations.

HIUS 167/267/ETHN 180. Topics in Mexican-American History (4)
This colloquium studies the racial representation of Mexican Americans in the United States from the nineteenth century to the present, examining critically the theories and methods of the humanities and social sciences. *Prerequisite: upper-division standing.*

HIUS 169/269. Topics in American Legal and Constitutional History (4)
A reading and discussion course on topics that vary from year to year, including American federalism, the history of civil liberties, and the Supreme Court. *Prerequisite: consent of instructor.*

HIUS 171/271. Topics in the American Revolution (4)
Colloquium dealing with selected topics on the American Revolution and formation of the United States. Themes will vary from year to year. *Prerequisite: department stamp or consent of instructor.*

HIUS 175/275. Crime, Law, and Society in the United States, 1600–1900
This colloquium, examines the changing relationships between crime, the law, and society in the United States. We will pay particular attention to the changing forms of punishment, perceptions of crime and criminals, and the place of criminal law in the social order. Requirements will vary for undergraduates, M.A., and Ph.D. students. *Prerequisite: upper-division standing or consent of instructor.*

HIUS 176/276. Race and Sexual Politics
This seminar will explore the histories of sexual relations, politics, and cultures that both cross and define racial boundaries in the nineteenth and twentieth centuries. Reading will focus on the United States as well as take up studies sited in Canada and Latin America. Graduate students are expected to submit a more substantial piece of work. *Prerequisite: upper-division standing or consent of instructor.*

HIUS 180/ETHN 134. Immigration and Ethnicity in Modern American Society (4)
Comparative study of immigration and ethnic-group formation in the United States from 1880 to the present. Topics include immigrant adaptation, competing theories about the experiences of different ethnic groups, and the persistence of ethnic attachments in modern American society. *Prerequisite: upper-division standing.*

HIUS 181/281. Topics in Twentieth Century United States History (4)
A colloquium dealing with special topics in U.S. history from 1900 to the present. Themes will vary from year to year. *Prerequisite: department stamp or consent of instructor.*

HIUS 182/282. Special Topics in Intellectual History: Politics and Culture in the U.S. 1776–1860 (4)
Cultural and political construction of the American nation. Topics include: how citizenship and national

community were imagined and contested; importance of class, gender, and race in the nation's public sphere; debates over slavery expansion and democracy in defining national purpose. Requirements will vary for undergraduates, M.A., and Ph.D. students. Graduate students are required to submit a more substantial paper.

HIUS 183/283/ETHN 159. Topics in African American History (4)
A colloquium dealing with special topics in the history of people of African descent in the United States. Themes will vary from quarter to quarter. Requirements will vary for undergraduate, M.A., and Ph.D. students. Graduate students will be required to submit a more substantial piece of work. *Prerequisite: upper-division standing or consent of instructor.*

HIUS 184. Special Topics in American Urban History (4)
This colloquium explores various topics in the history of urban America, including the process of city development, social patterning in urban areas, city life and cultural styles, suburbanization, and the urban west. Topics will vary from year to year. *Prerequisite: department stamp or consent of instructor.*

HIUS 187/287. Topics in American Social History (4)
Colloquium on selected topics in American social history. Topics will vary from year to year, and the course may therefore be repeated for credit.

HIUS 199. Independent Study in United States History (4)
Directed readings for undergraduates under the supervision of various faculty members. *Prerequisite: consent of instructor and department stamp required.*

TOPICS

Courses

HITO 87. Special Freshman Seminar (1)
A seminar intended for exposing undergraduate students, especially freshmen, to exciting research programs conducted by department faculty. Enrollment is limited. Topic will vary quarter by quarter.

HITO 102. Religious Traditions: East Asian Religious Traditions (4)
Introduction to the major religious traditions of Asia: Hinduism, Buddhism, Taoism, Shinto, and Confucianism. The course will focus on one religion each year. Since special topics will vary from year to year the course may be repeated for credit three times. *Prerequisite: upper-division standing.* +

HITO 104. The Jews and Judaism in the Ancient and Medieval Worlds (4)
The political and cultural history of the Jews through the early modern period. Life under ancient empires, Christianity and Islam. The post-biblical development of the Jewish religion and its eventual crystallization into the classical, rabbinic model. +

HITO 105. The Jews and Judaism in the Modern World (4)
Topics include the political emancipation of the Jews of Europe; the emergence of Reform, Conservative, and Modern Orthodox Judaism; hasidism; modern antisemitism; Jewish socialism; zionism; the Holo-caust; the American Jewish community; the State of Israel.

HITO 111/211. Marxian Theory (4)
A survey and examination of the principal writings of Marx concerning economic theory and analysis. Emphasis on the theory of value, production, technical change, reproduction and accumulation. Some consideration will also be made of certain neo-Marxist contributions and critiques. *Prerequisite: introductory economics or consent of instructor.*

HITO 117 World History. 1200–1800
This course examines the interaction between sections of the globe after 1200. It emphasizes factors operating on a transcontinental scale (disease, climate, migration) and historical/cultural phenomena that bridge distance (religion, trade, urban systems). This is not narrative history, but a study of developments that operated on a global scale and constituted the first phase of globalization. *Prerequisite: upper-division standing or consent of instructor.* +

HITO 121. Geographic Information Systems for Historians and Social Scientists (4)
This course provides an introduction to the use of geographic information systems (GIS) in the analysis and display of data of interest to historians and social scientists. Topics include cartographic theory and aesthetics, data collection and retrieval, and training in the use of the ArcView GIS program. *Prerequisite: upper-division standing.*

HITO 126. A History of Childhood (4)
This course will examine the different ways that attitudes toward children have changed throughout history. By focusing on the way that the child was understood, we will examine the changing role of the family, the role of culture in human development, and the impact of industrialization and modern institutions on the child and childhood.

HITO 133. War and Society: The Second World War
An examination of the Second World War in Europe, Asia, and the United States. Focus will be on the domestic impact of the war on the belligerent countries as well as on the experiences of ordinary soldiers and civilians. *Prerequisite: upper-division standing or consent of instructor.*

Colloquia

The following courses are available to both undergraduate and graduate students. Undergraduates must receive a departmental stamp or permission of the instructor to register for the course. Requirements for each course will differ for undergraduate, M.A., and Ph.D. students.

HITO 169. History and Historians (4)
An introduction to the history of historical writing. Through discussion of selected readings, the course will focus on such issues as the development of historical thought, the nature of historiographical debates, the interpretation of sources, and the use of theoretical models in writing history. Courses can apply to any concentration within the history major. *Prerequisite: upper-division standing.* (History majors only.)

HITO 193/POLI 194/COM GEN 194/USP 194. Research Seminar in Washington D.C. (6)
Course attached to six-unit internship taken by student participating in the UCDC program. Involves weekly seminar meetings with faculty and teaching assistant and a substantial historical research paper. *Prerequisites: department stamp required; participating in UCDC program.*

HITO 194. History Honors (4)
A program of independent study providing candidates for history honors an opportunity to develop, in consultation with an adviser, a preliminary proposal for the honors essay. An IP grade will be awarded at the end of this quarter. A final grade will be given for both quarters at the end of HITO 195. *Prerequisite: consent of instructor. Department stamp required.*

HITO 195. The Honors Essay (4)
Independent study under the supervision of a faculty member leading to the preparation of an honors essay. A letter grade for both HITO 194 and 195 will be given at the completion of this quarter. *Prerequisite: consent of instructor. Department stamp required.*

HITO 196. Honors Seminar (4)
The nature and uses of history are explored through the study of the historian's craft based on critical analysis of historical literature relating to selected topics of concern to all historians. Required of all candidates for history honors and open to other interested students with the instructor's consent. *Department stamp required.*

HITO 197. Field Study
Program to be arranged between student and instructor depending on student's needs and instructor's advice. Students are expected to produce substantial final papers on specific subjects described in student's proposals. To prepare such papers will require extensive research and writing. Will require bimonthly reports and one final paper. *Prerequisite: consent of instructor.*

HITO 198. Directed Group Study (4)
Directed group study on a topic not generally included in the regular curriculum. Students must make arrangements with individual faculty members. (P/NP grades only.) *Prerequisite: consent of instructor.*

HITO 199. Independent Study for Undergraduates (4)
Independent study on a topic not generally included in the regular curriculum. Students must make arrangements with individual faculty members. (P/NP grades only.) *Prerequisites: upper-division standing and consent of instructor.*

GRADUATE

Graduate standing is a prerequisite for all graduate-level courses. For more graduate courses (200+), look at history undergraduate colloquia (courses numbered 160–190).

HIGR 200. History and Social Theory (4)
A weekly reading/writing seminar. Themes include historical sociology and large-scale history, interdisciplinary approaches to history (anthropological, psychoanalytic, etc.), and historical method. Students from all fields welcome, though emphasis primarily on early modern period (1500–1800).

HIGR 205. Feminist Historical Studies (4)
An introduction to feminist historical studies, this course is designed for interested graduate students from all history field groups. Graduate students from other disciplines are also encouraged to participate. The course will provide students a rigorous training in women's history, in the feminist theories that undergird that scholarship, and in the emergent field of gender analysis. The particular content of the course will change from year to year, but each course

will include theoretical texts, historical case studies, and primary sources. Readings will be drawn from different times and places. This course is strongly recommended for those preparing minor fields in women's history. The course can be repeated twice for credit.

HIGR 207. Nationalism, Colonialism and Race (4)
A transdisciplinary and comparative course on the interplay of nationalism, colonialism, and race (as well as class and gender/sexuality) in the nineteenth and twentieth centuries. Texts will include classics by authors such as Franz Fanon, as well as theoretically informed newer works that analyze a variety of national and colonial conditions historically.

HIGR 208. History and Theory (4)
This is a one-quarter colloquium, designed for graduate students in modern history. The readings will emphasize developments in historical thinking over the past two centuries, particularly as these ideas influenced professional work. The course includes some major figures in social theory such as Marx and Weber, and addresses issues raised by postmodernism.

HIGR 210. Historical Scholarship on Modern Chinese History (4)
This course will introduce students to the monographic literature and the main historiographic controversies of modern Chinese history.

HIGR 211. Historical Scholarship on Modern Japanese History (4)
This course will introduce students to the monographic literature and the main historiographic controversies of modern Japanese history.

HIGR 212. Historical Scholarship on Modern East Asian History (4)
This course will introduce students to the monographic literature and the main historiographic controversies of modern East Asian history.

HIGR 213. Sources on Modern Chinese History (4)
An introduction to Chinese documentary sources and collections on Qing and Republican History. This course will introduce students to the language of Qing documents, and to the contents and uses of imperial documents and archives, documentary collections, periodicals, gazetteers, etc.

HIGR 214. Readings in Japanese on Modern Japan (4)
A one-quarter research and writing course based upon readings in Japanese on modern Japan. Emphasis on selection, collection, and critical evaluation of texts for historical research. Topics will vary from year to year and may be repeated with instructor's permission. *Prerequisite: graduate standing or permission of instructor.*

HIGR 215A-B. Research Seminar in Modern Chinese History (4-4)
A two-quarter research seminar in Chinese history. A paper, based on original research, will be due in the second quarter. Seminar topics will vary. Reading knowledge of Chinese is expected. An IP grade will be awarded at the end of the first quarter. Final grade will not be given until the end of the second quarter. *Prerequisite: 215A is a prerequisite for 215B.*

HIGR 216A-B. Research Seminar in Modern Japanese History (4-4)
A two-quarter research seminar in Japanese history. A paper, based on original research, will be due in the second quarter. Seminar topics will vary. Reading knowledge of Japanese is expected. An IP grade will be awarded at the end of the first quarter. Final grade will not be given until the end of the second quarter. *Prerequisite: 216A is a prerequisite for 216B.*

HIGR 220. Historical Scholarship on European History, 1500–1715 (4)
Introduction to the historiography of Renaissance, Reformation, and early modern Europe: an overview of methodologies with emphasis on sources and critical approaches. Required for all beginning European history graduate students.

HIGR 221. Historical Scholarship on European History, 1715–1850 (4)
Selected topics in European history from the early modern to the modern era. Readings and discussions focus on issues of methodology and interpretation. Required for all beginning European history graduate students.

HIGR 222. Historical Scholarship on European History, since 1850 (4)
Critical evaluation of selected topics in the period of modern Europe from the mid-nineteenth century to the present. Required for all beginning European history graduate students.

HIGR 225. Readings in Modern Russian History (4)
Students will read major works on Revolutionary Russia and Soviet history. Attention will be paid to both classic and revisionist works.

HIGR 227A-B. Seminar in Spanish History (4-4)
Readings and critical analysis of selected topics and important works in the history of Spain. May be repeated as content changes. Proficiency in Spanish required to repeat course, but not for the first time taken. An IP grade will be awarded at the end of the first quarter. Final grade will not be given until the end of the second quarter. *Prerequisites: fluent reading knowledge of Spanish desired. German or French also desirable.*

HIGR 230A-B. Research Seminar in Early Modern Europe (4-4)
Selected topics in the period from the sixteenth century through the early nineteenth, with an emphasis on the theory and practice of socio-economic history. An IP grade will be awarded at the end of the first quarter. Final grade will not be given until the end of the second quarter. *Prerequisite: 230A is a prerequisite for 230B.*

HIGR 231A-B. Research Seminar in Modern European Intellectual and Cultural History (4-4)
Selected topics in the period of the nineteenth and twentieth centuries. An IP grade will be awarded at the end of the first quarter. Final grade will not be given until the end of the second quarter. *Prerequisite: 231A is a prerequisite for 231B.*

HIGR 232A-B. Research Seminar in Modern European Social and Political History (4-4)
Selected topics in the period of the nineteenth and twentieth centuries. An IP grade will be awarded at the end of the first quarter. Final grade will not be given until the end of the second quarter. *Prerequisite: 232A is a prerequisite for 232B.*

HIGR 236A-B. Research Seminar in History of Science (4-4)
A two-quarter research seminar comprising intensive study of a specific topic in the history of science. The first quarter will be devoted to readings and discussions; the second chiefly to the writing of individual research papers. Topics vary from year to year, and students may therefore repeat the course for credit. An IP grade will be awarded at the end of the first quarter. Final grade will not be given until the end of the second quarter.

HIGR 237. Topics in the History of Ocean Sciences (4)
(Cross-listed with SIO 201.) Intensive study of specific problems in the history of the ocean sciences, and of related earth and atmospheric sciences, in the modern period. Topics vary from year to year, and students may therefore repeat the course for credit.

HIGR 238. Introduction to Science Studies (4)
(Cross-listed as Communication 225A, Philosophy 209A, and Sociology 255A.) Study and discussion of classic work in history of science, sociology of science and philosophy of science, and of work that attempts to develop a unified science studies approach. Required for all students in the Science Studies Program. *Prerequisite: enrollment in Science Studies Program.*

HIGR 239. Seminar in Science Studies (4)
(Cross-listed as Communication 225B, Philosophy 209B, and Sociology 255B.) Study and discussion of selected topics in the science studies field. Required for all students in the Science Studies Program. May be repeated as course content changes annually. *Prerequisite: enrollment in Science Studies Program.*

HIGR 240. Colloquium in Science Studies (4)
(Cross-listed as Communication 225C, Philosophy 209C, and Sociology 255C.) A forum for the presentation and discussion of research in progress in science studies, by graduate students, faculty, and visitors. Required for all students in the Science Studies Program. May be repeated as course content changes annually. *Prerequisite: enrollment in the Science Studies Program.*

HIGR 245A-B-C. Historical Scholarship on Latin American History (4-4-4)
Introduction to the literature of Latin American history. A three-quarter sequence of readings and discussions taught each quarter by members of the staff. Required for all beginning students for a graduate degree specializing in Latin American history; open and strongly recommended to other students using Latin American history as a secondary field for a graduate degree. HIGR 245A covers the colonial period, from conquest to independence to today; HIGR 245B covers South America from independence to today; HIGR 245C covers Mexico, Cuba, and Central America from independence to today. The three quarters need not be taken in sequence. Reading knowledge of Spanish is required.

HIGR 247A-B. Research Seminar in Colonial Latin America (4-4)
A two-quarter course involving readings and research on sixteenth- through eighteenth-century Latin America. Students are expected to compose a paper based on original research that is due in the second quarter. Reading knowledge of Spanish required. An IP grade will be awarded at the end of the first quarter. Final grade will not be given until the end of the second quarter.

HIGR 248A-B. Research Seminar in Latin America, National Period (4-4)
A two-quarter course involving readings and research; the first quarter is devoted to the nineteenth and the second quarter to the twentieth century. Students are expected to compose a paper based on original research that is due in the second quarter. An IP grade will be awarded at the end of the first quarter. Final

grade will not be given until the end of the second quarter. Reading knowledge of Spanish and/or Portuguese is helpful but not required.

HIGR 249. Topics in Colonial Latin America (4)
One or two topics in colonial history will be analyzed in depth; reading knowledge of Spanish is expected.

HIGR 252. History, Social Evolution, and Intellectuals in the Andes: Mariátegui, Haya de la Torre, and Arguedas (4)
The course will study three major twentieth-century interpreters of Andean history and society. Mariátegui is Latin America's most original socialist intellectual; Haya de la Torre is the founder of Peru's most important party; and Arguedas was the most profound interpreter of the role of Indian peasants in the Andean nations.

HIGR 255. The Literature of Ancient History (4)
An introduction to the bibliography, methodology, and ancillary disciplines for the study of ancient history together with readings and discussion on selected topics within the field. May be repeated for credit, topic will vary year to year.

HIGR 260A-B-C. Historical Scholarship on Judaic Studies (4-4-4)
Weekly graduate seminar. Faculty and students present results of research. Student research may be towards course work on thesis.

HIGR 264. Topics in Pre-Islamic Jewish History (4)
An examination in depth of selected topics in the history of the Jewish people and Jewish civilization in pre-Islamic times.

HIGR 265A-B-C. Historical Scholarship on American History (4-4-4)
A three-quarter sequence of readings and discussions on the bibliographical and monographic literature of American history from the colonial period to the present. Taught by different members of the staff each quarter, the course is required of all beginning graduate students in American history.

HIGR 267A-B. Research Seminar in United States History (4-4)
Readings and discussion in selected areas of American history for advanced graduate students. An IP (in progress) grade will be awarded the first quarter. The second quarter will be devoted to the presentation, discussion, and evaluation of work in progress. A final grade will be awarded at the end of the second quarter. *Prerequisite: 267A is a prerequisite for 267B.*

HIGR 271. New Research Directions in U.S. History (4)
Students will develop skills in presenting and assessing new research and offering feedback to work in progress by senior students and faculty. Course is required to be taken twice by third-year students and highly recommended for audit by all students in U.S. History. (S/U grades only.)

HIGR 273. The Culture of Consumption (4)
(Cross-listed with COGR 240.) This course will explore the development and cultural manifestations of consumerism in the nineteenth and twentieth centuries. Topics will include the rise of museums, the development of mass-market journalism and literature, advertising, and the growth of commercial amusements. Readings focus primarily on the United States. Students will be encouraged to think historically and comparatively.

HIGR 295. Thesis Seminar (4)
For students advanced to candidacy to the doctorate. Discussion, criticism, and revision of drafts of chapters of theses and of work to be submitted for publication.

HIGR 298. Directed Reading (1-12)
Guided and supervised reading in the literature of the several fields of history. This course may be repeated for an indefinite number of times due to the independent nature of the content of the course. (S/U grades permitted.)

HIGR 299. Ph.D. Thesis Direction (1-12)
Independent work by graduate students engaged in research and writing of doctoral theses. This course may be repeated for an indefinite number of times due to the independent nature of thesis writing and research. (S/U grades only.)

HIGR 500. Apprentice Teaching in History (1-4)
A course in which teaching assistants are aided in learning proper teaching methods by means of supervision of their work by the faculty: handling of discussions, preparation and grading of examinations and other written exercises, and student relations. (S/U grades only.)

Human Development Program

OFFICE: 2839 AP&M Annex, Muir College
http://www.hdp.ucsd.edu

Professors

Farrell Ackerman, Ph.D., *Linguistics*
Mark Appelbaum, Ph.D., *Psychology*
Ursula Bellugi, Ph.D., *Adjunct/Psychology (Salk Institute)*
Charles Briggs, Ph.D., *Ethnic Studies*
Sandra Brown, Ph.D., *Psychology and Psychiatry*
Aaron V. Cicourel, Ph.D., *Emeritus, Cognitive Science/Sociology*
Michael Cole, Ph.D., *University Professor, Communication*
Eric Courchesne, Ph.D., *Neurosciences*
Karen Dobkins, Ph.D., *Psychology*
Jean M. Mandler, Ph.D., *Emeritus, Cognitive Science*
Hugh B. Mehan, Ph.D., *Sociology/CREATE*
Carol Padden, Ph.D., *Communication*
Laura Schreibman, Ph.D., *Psychology*
Joan Stiles, Ph.D., *Director, Cognitive Science*

Associate Professors

James Moore, Ph.D., *Anthropology*
Olga A. Vasquez, Ph.D., *Communication*

Assistant Professors

Leslie J. Carver, Ph.D., *Psychology*
Gedeon Deak, Ph.D., *Cognitive Science*
Gail Heyman, Ph.D., *Psychology*

Senior Lecturer with Security of Employment

Paula Levin, Ph.D., *Teacher Education Program*

Lecturers

Stephen Potts, Ph.D., *Literature*
Clarissa J. Reese, Ph.D., *Human Development Program*

The Human Development Major

The scientific study of human development focuses on issues of growth, development, and behavioral change across the lifespan. The Human Development Program is interdisciplinary, incorporating courses from the Departments of Anthropology, Biology, Cognitive Science, Communication, Ethnic Studies, History, Linguistics, Literature, Psychology, Sociology, Teacher Education Program, and Urban Studies and Planning Program. The curriculum is designed to emphasize the idea of development as an essential perspective from which to understand human behavior. The courses cover a broad spectrum of issues in human development; from brain and perceptual development, to reasoning and problem solving, to social interaction and the evolution of cultural systems. The Human Development Program unifies and coordinates the excellent research and teaching resources currently available on campus in this area and profiles the factors that influence the ways in which humans develop and change.

Human development is a very large field, but there is a set of basic questions which serve to define and integrate it: What underlies the development of human knowledge? To what extent is the capacity to know, indeed the concepts themselves, encoded in the genes? How is the role of learning and environmental influences accounted for? How do we learn? What are the ways in which children become competent participants in their social groups? What is the origin and nature of social interaction and organization?

The study of human development has become increasingly central to a wide range of important issues affecting infants, young children and adolescents, as well as the changing structure of the

American family and public policy on children and education. An understanding of the processes which underlie human development is crucial to our evaluation of these issues and to our ability to offer avenues for remediation of the attendant problems. The three major areas of study within the Human Development Program are: *Biological Development, Ontogenetic Development, and Socio-Cultural Development.* These areas consider issues which pertain to development of specific neural and cognitive processes and development within a larger social and cultural context.

Career Guidance

A degree in human development offers training of special interest to those considering admission to graduate or professional schools and careers in medicine, law, education, counseling, clinical psychology, public health, public policy, public administration, or social work. Students who are interested in these areas are advised to see a Human Development Program adviser for assistance in selecting elective and major courses. A major in human development is designed to impart fundamental skills in critical thinking, comparative analysis, research analysis, and written expression.

A human development major can offer preparation for teaching in elementary schools. However, if you are interested in earning a California teaching credential from UCSD, contact the Teacher Education Program (TEP) for information about prerequisite and professional preparation requirements. It is recommended you contact TEP as early as possible in your academic career.

Education Abroad

Students are often able to participate in the UC Education Abroad Program (EAP) and UCSD's Opportunities Abroad Program (OAP) while still making progress towards the major. Students interested in studying abroad should see a Human Development Program adviser to discuss curriculum plans and appropriate courses. It is strongly recommended that students obtain HDP pre-approval for EAP courses that are intended to count toward the major. Information on EAP/OAP is detailed in the Education Abroad Program section of the *UCSD General Catalog.* Interested students should contact the Programs Abroad Office in the International Center and visit the Web site at http://www/icenter/pao. Financial aid is applicable and special study abroad scholarships are available.

Prerequisites for Human Development Majors

A bachelor of arts degree in human development will be given to students who satisfactorily complete the general-education and graduation requirements of Marshall, Muir, Revelle, Roosevelt, Sixth, or Warren College in addition to the Human Development Program requirements. In accordance with UCSD academic regulations, upper-division courses used to satisfy major requirements cannot be applied towards minors (please note there is some overlap permitted for double majors). See college adviser and major adviser for questions and restrictions.

Applying for the HDP Major

Students who wish to declare the Human Development Program major must meet premajor requirements and apply for entrance into the major. All lower-division requirements must be fulfilled before applying for the major. All lower-division courses must be completed with a grade of C or better. The cumulative GPA for the eight lower-division courses must equal or exceed 2.75. Students must meet with an HDP adviser and obtain approval to declare the human development major, no later than the second quarter of the student's junior year.

Grade Requirements for the Major

A minimum grade-point average of 2.0 is required in the major. Students must receive a grade of C- or better in any course counted toward fulfillment of the major requirements. **All courses taken to satisfy the program's lower- and upper-division requirements must be taken for a letter grade.** *HDP 1, HDP 150, HDP 181, and HDP 191 must be taken in residence.* No substitutions will be approved.

Lower-Division Requirements

1. **Introduction to Human Development: HDP1**
2. **One statistics course** selected from the approved list: PSYC 60, COGS 14, or BIEB 100, ECON 120A
3. **One formal skills course** selected from: the approved list: PHIL 10, PHIL 12, MATH 10 sequence, MATH 20 sequence

4 & 5. **Two biological sciences courses** selected from the approved list: ANLD 2, BILD 1, BILD 2, BILD 3, BILD 7, BILD 10, BILD 12, BILD 20, BILD 26, COGS 11, COGS 17, PSYC 2

6 & 7. **Two social sciences courses** selected from the approved list: ANLD 1, ANLD2, ANLD 3, COGN 20, COGS 1, COGS 11, HILD 7A, LIGN 4, LIGN 7, LIGN 8, LIGN 101, MMW 1, MMW 2, PSYC 1, PSYC 3, PSYC 6, Soc/L 1A, Soc/L 20

8. **One computer literacy course** selected from the approved list: MAE 5, COGS 3, CSE 5A

Upper-Division Requirements for the HDP Major:

A. **Three Methods Courses**

B. **Three Core Series courses**

C. **Six Development courses**

D. **HDP 150**

(Full information follows)

A. Methods Courses

1. **HDP 181** (Students are encouraged to take this course their junior year.)
2. **HDP 191** (Students are encouraged to take this course their junior year.)
3. One course selected from the following approved list*

ANGN 172. Life History Seminar and Practicum

BICD 131. Embryology Laboratory

BICD 133. Developmental Biology Laboratory

HDP 115/COMT 115. Media and Design of Social Learning Contexts

HDP 131. Fifth Dimension for Elementary Schools

HDP 135/COMT 116. Practicum in Child Development

PSYC 111A or B. Research Methods I or II

Soc/A 104. Field Research: Methods of Participant Observation

Soc/A 110A or B. Qualitative Research In Educational Settings

*Completion of HDP 194 A, B, and C (Honors Thesis) can be used to replace the third methods course (not HDP 181 or HDP 191).

B. Core Series

(3 courses selected from the approved list required, one from each DOMAIN)

***Domain 1:* The biological basis of human development**

ANBI 140. The Evolution of the Human Brain

ANBI 161. Human Evolution

COGS 115. Neurological Development and Cognitive Change

HDP 110. Brain and Behavioral Development

***Domain 2:* The social/cognitive basis of human development**

COGS 156. Language Development

HDP 121. Developing Mind

LIGN 171. Child Language Acquisition

LIGN 179. Second Language Acquisition

PSYC 167. Social and Emotional Development

PSYC 187. Development of Social Cognition

***Domain 3:* The socio-cultural basis of human development**

HDP 133. Socio-cultural Foundations of Human Development

HITO 126. History of Childhood

SOC/B 131. Sociology of Youth

SOC/C 129. The Family

C. DEVELOPMENT COURSES

(6 courses required; at least 1 from each area of focus)

Biological Development

ANBI 140. The Evolution of the Human Brain

ANBI 159. Biological and Cultural Perspectives on Intelligence

BICD 100. Genetics

BICD 130. Embryology

BICD 132. Molecular Basis of Development

BICD 134. Human Reproduction and Development

BIPN 144. Developmental Neurobiology

COGS 115. Neurological Development and Cognitive Change

COGS 184. Modeling the Evolution of Cognition

PSYC 168. Psychological Disorders of Childhood

Ontogenetic Development

COGS 113/PSYC 136. Cognitive Development

COGS 154. Communication Disorders In Children and Adults

COGS 156. Language Development

COHI 100. Introduction to Communication and the Individual

COHI 114. Bilingual Communication

COHI 119. Learning to Read

COHI 121. Literacy, Social Organization, and the Individual

LIGN 171. Child Language Acquisition

LIGN 179. Second Language Acquisition

LTWL 114. Children's Literature

LTWL 116. Adolescent Literature

PSYC 122. Aging

PSYC 156. Cognitive Development in Infancy

PSYC 167. Social and Emotional Development

PSYC 168. Psychological Disorders of Childhood

PSYC 172. Psychology of Human Sexuality

PSYC 180. Adolescence

PSYC 187. Development of Social Cognition

Socio-Cultural Development

ANBI 159. Biological and Cultural Perspectives on Intelligence

COCU 149. Youth, Culture, and Media

COHI 123. Children and Media

HILA 117. Indians, Blacks, and Whites: Family Relations in Latin America

LTWL 114. Children's Literature

LTWL 116. Adolescent Literature

PSYC 167. Social and Emotional Development

PSYC 180. Adolescence

Soc/B 117. Language, Culture, and Education

Soc/B 118A. Gender and Language in Society

Soc/C 129. The Family

Soc/B 131. Sociology of Youth

Soc/C 159. Special Topics in Organizations and Institutions *(Only when topic is approved for HDP major)*

TEP 115. Cognitive Development and Education

TEP 117. Language, Culture, and Education

USP 145. Aging—Social and Health Policy Issues

D. HDP 150. Advanced Human Development

(HDP students should enroll in this course in their senior year.)

Advanced Human Development Requirement HDP 150

Seminar for graduating HDP seniors. Readings and discussion of special topics in human development. Provides advanced-level study on subfields of human development. Topics vary quarterly. *Prerequisites: HDP1, HDP 181, HDP 191, senior standing, and department approval one quarter prior to enrollment.*

Field Research Requirement HDP 191

This course provides students with the opportunity to participate jointly in a research project in conjunction with a mentor/collaborator from a local service site. This applied research experience allows students to design and conduct research projects in a variety of settings ranging from laboratory research settings to service oriented placements. In addition to literature research and a final paper at the end of the quarter, students will participate at an off-campus site for a minimum of four hours per week. Research sites are prearranged one academic year in advance (see the student affairs office or the HDP Web site for enrollment information). Students' interests and future career plans are considered for site placement. Various research orientations and methodologies are reviewed in class. *Prerequisites: HDP 1 and department approval one academic year prior to enrollment.*

Honors in Human Development HDP 194A-B-C

The Human Development Program offers an honors option for those students who have demonstrated excellence in the human development major. The honors program allows eligible undergraduates to explore advanced issues in the field through an honors thesis on a topic of their choice and under faculty supervision. In order to be admitted to the honors program, students must have 1) junior standing and 2) maintained a minimum cumulative grade-point average of 3.2, and a 3.5 GPA for courses taken in the human development major. Interested students need to apply for departmental honors in spring quarter of their junior year. Students in the honors program are expected to complete the following additional requirements:

1. An advanced course in statistics or methods design (see the HDP student affairs office for more information).
2. HDP 194A-B-C, a year-long independent research project, which results in an Honors Thesis.
3. Weekly attendance of the Center for Human Development Seminar and participation.

Petitioning Courses

There are three circumstances under which petitions to receive credit for courses not explicitly approved for the major will be considered (all approved courses are detailed in the *UCSD General Catalog,* HDP section): Requests from transfer students, requests from students planning to study abroad, and exceptional courses identified by a student. In all cases, students are required to submit a petition ***in writing*** that clearly describes the course for which they wish to receive HDP major credit, and to attach to the petition as much information as possible about the content of the course (e.g., syllabus, course description, etc.). With the exception of courses petitioned by transfer students, ALL REQUESTS FOR APPROVAL OF COURSES NOT EXPLICITLY LISTED IN THE *UCSD GENERAL CATALOG* SHOULD BE SUMBITTED BEFORE THE COURSE IS TAKEN BY THE STUDENT.

Transfer students. Students transferring from a community college, or other university must petition for HDP credit for courses taken at their previous institution. For students transferring from the California Community College System, articulation agreements for many courses have been developed that facilitate the petition process. Transfer students should make an appointment with an HDP adviser to review courses for which they will most likely receive credit and fill out a written petition for each course.

Education Abroad. Students planning to study abroad may receive credit toward the major for courses taken in another country. IT IS STRONGLY RECOMMENDED THAT STUDENTS RECEIVE PRELIMINARY APPROVAL (BEFORE LEAVING THE COUNTRY) FOR COURSES THEY ARE CONSIDERING TAKING DURING THEIR TIME ABROAD. While the preliminary approval does not guarantee that the actual course will be approved, the great majority of courses for which preliminary approval has been obtained are approved when the actual petition is submitted upon the student's return.

Other courses. Occasionally students identify a UCSD course that has the potential to fulfill an HDP requirement. Students may petition ***in writing*** to request credit for such courses. However, it is important to note that very few such petitions are successful, and students are strongly cautioned to petition and receive approval for such a course BEFORE ENROLLING IN THE COURSE.

Note: Courses are not officially approved for credit until the written petition has been approved by the HDP Executive Committee and signed by the HDP director.

The Minor Program

A total of **seven** courses are required to complete a minor in human development. These include **Introduction to Human Development** (HDP 1), and **six** developmental courses, one from each major area of study from the developmental course list.

FINISH-IN-FOUR PLAN

Students interested in a particular career field should see the student affairs office for more specific Finish-in-Four plans for their particular college.

COURSES

LOWER-DIVISION

HDP 1. Introduction to Human Development (4)
This course introduces students to the central issues in the basic areas in human development. The course will explain relationships between biological, cognitive, social, and cultural aspects of development. Offered once per year. (F)

HDP 87. Freshman Seminar (1)
This seminar is designed to provide new students with the opportunity to explore an intellectual topic in a small seminar setting. Topics vary from quarter to quarter. Enrollment is limited to fifteen to twenty students, with preference given to entering freshmen. (F,W,S)

UPPER-DIVISION

HDP 110. Brain and Behavioral Development (4)
The purpose of this course is to familiarize students with basic mechanisms of brain and behavioral development from embryology through aging. Multiple levels of analysis will be discussed, including the effects of hormones on behavior, developmental events at the level of cells, structures, and neural systems, and the neural basis of cognition, social, perceptual, and language development. *Prerequisite: HDP 1 or PSYC 101.*

HDP 115. Media and Design of Social Learning Contexts (6)
(Same as COMT 115.) A combined lecture/lab course cross-listed in communication and human development. Students attend lecture, write field notes, and spend three hours per week in specially designed after-school setting working with children and designing new educational media and producing special projects. *Prerequisite: HDP 1 or COHI 100.*

HDP 121. The Developing Mind (4)
This course examines changes in thinking and perceiving the physical and social world from birth through childhood. Evidence of significant changes in encoding information, forming mental representations, and solving problems is culled from psychological research, cross-cultural studies, and cognitive science. *Prerequisite: HDP 1 and declared human development major.*

HDP 131. Fifth Dimension for Elementary Schools (6)
Students will participate four hours per week in classrooms at Torrey Pines Elementary School integrating the Fifth Dimension model of collaborative exploratory learning. Outside work will include readings and class preparation, as well as responding to children's written inquiries, writing field notes, and writing a paper. *Prerequisite: HDP 1.* (F,W,S)

HDP 133. Socio-cultural Foundations of Human Development (4)
This course will provide students with an understanding of the social and cultural foundations of human development. The topics will be explored with both national and international comparisons from infancy through adolescence. *Prerequisite: HDP 1 or PSYC 1.*

HDP 135. Practicum in Child Development (6)
(Same as COMT 116.) A combined lecture and laboratory course for students in psychology, communication, and human development. Student backgrounds should include a background in general psychology or communication. Students will be expected to spend four hours a week in a supervised practical after-school setting at one of the community field sites involving children. Additional time will be devoted to readings and class prep, as well as six hours a week transcribing field notes and writing a paper on some aspect of the fieldwork experience as it relates to class lectures and readings. *Prerequisite: HDP 1 or COHI 100 or PSYC 101.* (F,W,S)

HDP 150. Advanced Human Development (4)
Seminar for graduating HDP seniors. Readings and discussion of special topics in human development. Provides advanced-level study on subfields of human development. Topics vary quarterly. *Prerequisites: HDP 1, HDP 181, HDP 191, senior standing, and department approval.* (F,W,S)

HDP 181. Experimental Projects in Human Development Research (6)
This laboratory course in human development is designed around a variety of intensive experimental projects. With lectures providing background information on research methods and child development, each assignment will include data collection and/or analysis, and a written laboratory report. *Prerequisites: HDP 1 and departmental approval.* (F,W,S)

HDP 191. Field Research in Human Development (6)
This course combines lectures on research methodology (three hours/week) with an applied field research experience (four hours/week) conducted at a pre-approved study site. Required: Completion of a field notebook, review paper, oral presentation, and final paper. *Prerequisites: HDP 1, Students must submit the pre-enrollment questionnaire one academic year prior to enrollment. See HDP Web site for details.* (F,W,S)

HDP 194A-B-C. Honors Thesis (4-4-4)
Students will take part in a weekly research seminar. In addition, they will plan and carry out a three-quarter research project under the guidance of a faculty member. The project will form the basis for their senior hon-

ors thesis. *Prerequisites: overall GPA of 3.2, and a 3.5 GPA for courses taken in the human development major; an advanced course in statistics or experimental design, and consent of instructor.*

HDP 199. Independent Study in Human Development (4)
Independent study and research under the direction of a faculty member. Pass/No Pass only. *Prerequisites: consent of the instructor, completion of at least ninety undergraduate units with a minimum of 2.5 GPA, and a completed and approved Special Studies Form.*

Humanities

OFFICE: Galbraith Hall, Room 180,
Revelle College
http://humanities.ucsd.edu

The Humanities Program offers interdisciplinary courses in history, philosophy, and literature, with a focus on major aspects of the Western humanistic tradition. In these courses, students examine the development of a wide variety of ideas and forms of expression that exert a major influence on modern America. Through lectures and class discussions, and through the writing of essays, students learn to interpret literary, historical, and philosophical texts and to conduct independent critical assessments of documents and ideas.

The sequence of courses, Humanities 1 through 5, meets the humanities and writing requirement of Revelle College. Instruction in university-level writing is part of all five courses, but students in Humanities 1 and 2 (six units each) receive intensive writing instruction.

Students must have satisfied the university's Subject A requirement before registering for any part of the humanities sequence. Humanities 1 and 2 must be taken before Humanities 3-4-5.

For detailed description of the Revelle College humanities requirement, see "Revelle College, General-Education Requirements, Humanities."

COURSES

LOWER-DIVISION

1. The Foundations of Western Civilization: Israel and Greece (6)
Texts from the Hebrew Bible and from Greek epic, history, drama, and philosophy in their cultural context. Revelle students must take course for letter grade. *Prerequisite: satisfaction of the Subject A requirement.* (W)

2. Rome, Christianity, and the Middle Ages (6)
The Roman Empire, the Christian transformation of the classical world in late antiquity, and the rise of a European culture during the Middle Ages. Representative texts from Latin authors, early Christian literature, the Germanic tradition, and the high Middle Ages. Revelle students must take course for letter grade. *Prerequisite: satisfaction of the Subject A requirement.* (S)

3. Renaissance, Reformation, and Early Modern Europe (4)
The revival of classical culture and values and the reaction against medieval ideas concerning the place of human beings in the world. The Protestant Reformation and its intellectual and political consequences. The philosophical background to the scientific revolution. Revelle students must take course for letter grade. *Prerequisite: satisfaction of the Subject A requirement.* (F)

4. Enlightenment, Romanticism, Revolution (1660–1848) (4)
The enlightenment's revisions of traditional thought; the rise of classical liberalism; the era of the first modern political revolutions; romantic ideas of nature and human life. Revelle students must take course for letter grade. *Prerequisite: satisfaction of the Subject A requirement.* (W)

5. Modern Culture (1848–present) (4)
Challenges to liberalism posed by such movements as socialism, imperialism, and nationalism; the growth of new forms of self-expression and new conceptions of individual psychology. Revelle students must take course for letter grade. *Prerequisite: Satisfaction of the Subject A requirement.* (S)

195. Methods of Teaching Humanities (4)
An introduction to teaching humanities. Students are required to attend weekly discussions on methods of teaching humanities, and will teach discussion sections of one of the humanities courses. Attendance at lecture of the course in which the student is participating is required. (P/NP grades only.) *Prerequisite: consent of instructor.* (W,S)

199. Special Studies (2-4)
Individually guided readings or projects in area of humanities not normally covered in standard curriculum. *Prerequisite: upper-division standing or consent of instructor.*

200. Seminar in the Humanities (4)
Selected topics in the history, literature, and thought of Mediterranean antiquity and its successor-cultures. Emphasis on identifying both common themes and cultural distinctiveness. Discussion of pedagogical approaches to this material. Required of all graduate instructional assistants in the humanities sequence. *Prerequisite: graduate standing.* (F)

The Humanities Minor

The humanities minor consists of at least seven courses chosen from the listings of the Departments of History, Philosophy, Literature, Visual Arts, Music, and Theatre. All seven courses may be selected from the upper-division offerings, but at least five upper-division courses must be included. Students for whom Humanities 1-5 fulfill general-education requirements may use two of these courses towards fulfillment of requirements for the humanities minor.

For students who entered UCSD before January 1, 1998, the required number of courses for the minor is six courses, at least three of which must be upper-division.

Courses selected for the minor must be selected from the offerings of more than one department. They must concern themselves with more than one historical, national, or ethnic culture; and they must offer broad treatment of centrally important topics in the humanities. Thus, a course on the history of the United States since the Civil War would be appropriate for the humanities minor, while a course in the history of California would not.

Here are some examples of study lists appropriate for the present humanities minor:

Example 1:

History: HILD 2AB: United States
History: HILD 11: East Asia and the West
Literature: LTEA 110B: Modern Chinese Fiction in Translation
Philosophy 160: Ethical Theory
Philosophy 153: Philosophy of History

Example 2:

History: HILA 102: Latin America in the Twentieth Century
History: HIAF 110: History of Africa to 1880
Literature: LTAM 110: Latin American Literature in Translation
Literature: LTEN 184: African-American Poetry
Music 114: Music of the Twentieth Century
Visual Arts 126DN: African and Afro-American Art

Example 3:

Literature: LTEN 145: The English Novel in the Twentieth Century
Literature: LTEN 146: Women and English/American Literature
Literature: LTNE 100: The Bible and Western Literature
Philosophy 175: Aesthetics
Philosophy 177: Philosophy and Literature
Theatre: TH/HS 11: History of Theatre I: Classical to Renaissance

Students should review their plans for the minor with the humanities adviser as well as with the advisers in their college. Before undertaking the minor, students must submit a study list for approval to the humanities office.

The Humanities Majors

Normally, students interested in majoring in humanities must choose a specific major in the humanities departments, i.e., history, literature, or philosophy. But students from Revelle and Muir Colleges may request to graduate with an approved individual/special project major in the humanities.

Graduate School of International Relations and Pacific Studies (IR/PS)

OFFICE: Building 4, Level 1, Robinson Building Complex

Professors

Julie Collins-Sullivan, Ph.D.
Peter F. Cowhey, Ph.D., *Dean*
Richard E. Feinberg, Ph.D.
Peter A. Gourevitch, Ph.D.
Stephan M. Haggard, Ph.D.
Gordon H. Hanson, Ph.D.
Takeo Hoshi, Ph.D.
Miles Kahler, Ph.D.
Alex Kane, Ph.D.
Lawrence B. Krause, Ph.D., *Emeritus*
Ellis S. Krauss, Ph.D.
Bruce N. Lehmann, Ph.D.
Barry J. Naughton, Ph.D.
Susan L. Shirk, Ph.D.
Matthew F. Shugart, Ph.D.
Y.-H. Tohsaku, Ph.D.
Jeffrey R. Vincent, Ph.D.

Associate Professors

Roger E. Bohn, Ph.D.
Ulrike Schaede, Ph.D.
Barbara F. Walter, Ph.D.
Christopher M. Woodruff, Ph.D.

Assistant Professors

Edward Malesky, Ph.D. *(Acting)*
Jessica Wallack, Ph.D. *(Acting)*
Craig McIntosh, Ph. D.
Krislert Samphantharak, Ph.D.

Adjunct Professors

Julian R. Betts, Ph.D.
Marsha A. Chandler, Ph.D.
William M. Chandler, Ph.D.
Wayne A. Cornelius, Ph.D.
Paul W. Drake, Ph.D.
Theodore Groves, Ph.D.
Germaine A. Hoston, Ph.D.
David A. Lake, Ph.D.
David R. Mares, Ph.D.
Michael M. May, Ph.D.
James E. Rauch, Ph.D.
Peter H. Smith, Ph.D.
Dale E. Squires, Ph.D.

Associate Adjunct Professors

Lisa R. Shaffer, Ph.D.
Christena L. Turner, Ph.D.

The Master of Pacific International Affairs (MPIA)

Requirements for Admission

Students interested in pursuing the MPIA degree program at UCSD's Graduate School of International Relations and Pacific Studies (IR/PS) must have earned a B.A., or its equivalent, with training comparable to that provided by the University of California. A minimum scholastic average of 3.0 or better is required for course work completed in upper-division or prior graduate study. Undergraduate preparation that includes one or more of the following is strongly encouraged: the social sciences (specifically economics and political science) and history; and quantitative methods (such as calculus and statistics); foreign language and related area studies courses. Students with an undergraduate background in the sciences, engineering, or the arts are also encouraged to explore this degree program. The admissions committee looks for students with previous professional employment, a history of meaningful international experience, and demonstrated leadership ability.

Applicants must submit three letters of recommendation from individuals who can attest to their academic or professional competence and to the depth of their interest in pursuing graduate training in international affairs.

Applicants are required to submit the Graduate Record Exam (GRE) scores (verbal, quantitative, and analytical). (Indicate code #R4836 for UCSD, IR/PS department code #1901.) Scores from the Graduate Management Admission Test (GMAT) may be substituted. (Indicate code #4927 for UCSD, Pacific International Affairs.) A minimum score of 550 on the paper/pencil version and a minimum score of 213 on the computer-based version of the Test of English as a Foreign Language (TOEFL) is required of all international applicants whose native language is not English and whose undergraduate education was conducted in a language other than English. Students who score below 600 on the paper/pencil and 250 on the computer-based TOEFL examination are strongly encouraged to enroll in an English as a second language program before beginning graduate work.

Interviews are not required for admission to the MPIA program. Orientation tours are available for all applicants who would like further information about the degree programs. Tours assist applicants in becoming better acquainted with IR/PS's graduate programs and in understanding how these programs might relate to their long-term career goals. To receive a tour schedule, applicants should contact the IR/PS Office of Admissions at (858) 534-5914.

The MPIA is a two-year, full-time program. Part-time study is feasible within the MPIA curriculum. The maximum course load for half-time study is six units.

The MPIA Curriculum (96 units)

The MPIA curriculum (96 units) is made up of a set of core disciplinary and skill-oriented courses (36 units), a regional specialization (8 units), the foreign language requirement (up to 24 units), a professional Career Track (24 units), and unstructured electives.

CORE CURRICULUM

The Core Curriculum is designed to integrate diverse subject areas such as international management, international relations, applied economics, and comparative public policy. It comprises the following courses:

Globalization, the World System & the Pacific *(IRCO 412)*
Managerial Economics *(IRCO 401)*
Policy Making Processes *(IRCO 400)*
Quantitative Methods *(IRCO 453 and IRCO 454)*
International Politics & Security *(IRCO 410)*
International Economics *(IRCO 403)*

Finance *(IRCO 421)*
Accounting *(IRCO 420)*
Capstone Course—choices include
Managerial Decision Making *(IRCO 460)*,
Business and Government in the Global Economy *(IRCO 461)*, and
Public Policy Workshop *(IRCO 462)*

THE REGIONAL SPECIALIZATION

The regional specialization is made up of two designated courses on the economy and political system of a student's chosen country or region. All students must complete a regional specialization, and may choose from among the following five options: Latin America, Japan, Korea, China, and Southeast Asia.

THE FOREIGN LANGUAGE REQUIREMENT

IR/PS considers foreign language competency to be an indispensable skill for international relations professionals. The foreign language requirement is designed to ensure that students achieve a level of competency to assist in their global interactions. The foreign language requirement may be satisfied in any one of three ways: (a) native speaker ability; (b) completing six quarters (four semesters) of college-level language instruction from UCSD or a comparable institution, with a grade of B or better in the final course; or (c) passing a special IR/PS-administered language exam, which is the equivalent of the final exam administered in the sixth-quarter course in the selected language. The foreign language requirement may be partially or wholly completed prior to matriculation at IR/PS. Please contact the IR/PS Language Program for additional information.

Students must fulfill the foreign language requirement in a language that corresponds to their elected region of specialization. In rare cases, students who demonstrate a strong interest in selecting a foreign language that does not correspond to their chosen area of regional specialization may petition to do so. Students may select either Brazilian Portuguese or Spanish when studying Latin America. Students specializing in China, Japan, or Korea, must study Chinese (Cantonese, Mandarin, or other dialect), Japanese, or Korean, respectively. Students electing to specialize in Southeast Asia may study Bahasa Indonesia, Bahasa Malay, Chinese, Thai, Tagalog, Vietnamese, or other approved language. Please contact the IR/PS Language Program for further information.

Beyond the basic language requirement, IR/PS also offers the option of certification of more advanced language proficiency for students who choose to pursue further language study. Students pursuing advanced language skills are strongly encouraged to undertake significant language study prior to coming to IR/PS.

Students on the Country and Regional Studies track are subject to a different foreign language requirement. These students must pass both the speaking and the reading proficiency examination in their selected language. The writing proficiency examination is optional. The minimum required level of proficiency is equivalent to a Foreign Service Institute (FSI) Scale 2+ for Spanish, 2 for Portuguese, and 2- for most other languages.

The proficiency examination is administered throughout the academic year. Students not following the Country and Regional Studies track may take the exam once free of charge in a language that IR/PS currently provides instructional support. Those students on the Country and Regional Studies track may take the exam twice free of charge, regardless of language selection. Please consult with the IR/PS Language Program Office for additional information.

A variety of language courses are offered by UCSD. IR/PS offers four-unit language courses for international relations professionals in Brazilian Portuguese, Japanese, Mandarin Chinese, and Spanish at the intermediate or advanced levels. In addition, subject to demand, courses in Bahasa Indonesia, Korean, Vietnamese, or other Pacific Rim languages may be offered. Students electing to study a foreign language where IR/PS instructional support is not offered must secure their own language instruction and funding. Course credit for self-supported language learning may be given upon evaluation and approval of the director of the Language Program. Please contact the IR/PS Language Program for additional information.

Students are placed in foreign language courses based on prior preparation and on the results of a placement test administered during the week of orientation. Students with a lower level of language proficiency are placed in beginning language courses offered by the Chinese Studies Program, the Japanese Studies Program, and the Department of Linguistics or Literature.

CAREER TRACKS

Beyond the core curriculum, the regional specialization, and the foreign language requirement, students are offered an array of Career Tracks from which to choose. The Career Tracks provide an opportunity to focus on a specialized professional career path and to work closely with other students and faculty who share similar interests. A Career Track consists of six courses (twenty-four units). Each track combines some designated requirements and a range of relevant electives from which to choose. All students must take a Career Track. A student whose interests do not fall within the existing range of tracks may take the Self-Design Track, and create a tailor-made package of courses in consultation with their faculty adviser. Currently, IR/PS offers the following Career Tracks:

International Management
International Politics
International Environmental Policy
Public Policy
international Economics
Development & Non-Profit Management
Country & Regional Studies
Self-Design (approval of faculty adviser and associate dean required)

ELECTIVES

Students may use remaining units to take electives across the range of IR/PS courses in management, political science, economics, regional studies, and language, as well as (with approval) courses offered elsewhere on campus. The number of elective units available to a student will vary, depending on factors such as prior language study. Prospective students are advised to consult the IR/PS Office of Admissions for a full list of elective courses currently offered.

Internships

Students are encouraged to participate in various internship programs that are available in business and industry, federal and state government, and through various foundations and institutions. The school has established links to a number of programs with internship.

Education Abroad Program

Students are encouraged to participate in the Education Abroad Programs (EAP) in their second year of study. Though this will necessitate a third year of study to meet MPIA requirements, the opportunity provides unparalleled

experience in the selected regional study area and language. By petition, certain credits earned through EAP may be applied to the MPIA degree requirements.

Career Services

The IR/PS Career services team provides students with expertise, guidance, and resources to successfully manage their careers. Career development. This personalized program begins in career management orientation before the student's first quarter and continues throughout the two-year program.

Career services include individual career consulting appointments, workshops, employer/alumni panels, internship employment listings, and on-campus interview. Specialized workshops explore resume writing, cover letters, interviewing skills (including videotaped mock interviews), labor market trends, effective job search strategies, job offer evaluation, and negotiation of total compensation packages.

The Ph.D. in Economics and International Affairs

Requirements for Admission

Students who seek admission to the program must have a B.A. or the equivalent from an institution of comparable standing to the University of California. Preference will be given to students with prior academic records of distinction and to those who have a background in one of the fields of emphasis and/or geographical areas covered by the program. GRE scores (verbal, quantitative, and analytical) are required of all applicants. (Indicate code #R4836 for UCSD, IR/PS department code #1901.)

A minimum score of 550 on the paper/pencil version and a minimum score of 213 on the computer-based version of the Test of English as a Foreign Language (TOEFL) is required of all international applicants whose native language is not English and whose undergraduate education was conducted in a language other than English. Students who score below 600 on the paper/pencil and 250 on the computer-based TOEFL examination are strongly encouraged to enroll in an English-as-a-Second-Language Program (ESL) before beginning doctoral work.

The Ph.D. Curriculum

Program of Study

The Ph.D. in economics and international affairs prepares students for research careers in economics, with an emphasis on international affairs and the Pacific region. The program combines the analytical skills of economics with political economy, institutional analysis, and region/empirical knowledge.

Program Advisory Committee

Each student is assigned a Program Advisory Committee of four economics and IR/PS faculty, at least one must be from economics, one from IR/PS and one outside member from another UCSD department. With this committee, the student works out a plan of study that the committee must approve. The student must make satisfactory progress in a coherent program of course work and reading courses, which meet the approval of the Program Advisory Committee.

Course Requirements

The Ph.D. curriculum in economics and international affairs is designed to provide students with basic training in the techniques of modern economics, as well as empirical and institutional knowledge of the Pacific region. The first year will consist of the three sequences of microeconomics, macroeconomics, and econometrics, taught in the Department of Economics. The second year will consist of continuation of the three series plus seven electives. Two of these electives will be an IR/PS sequence in political economy. In subsequent years, courses will consist of the regional sequence, an empirical project, and two third-year papers.

Regional Requirement

Students must take at least three courses, one of which may be a reading course on policy processes and issues in the Pacific region. These courses may consider the Pacific region as a whole, as a sub-region, or examine individual countries. The courses may be in both IR/PS and, with prior permission, related departments. Some students may choose to take more than the minimum three courses to deepen their knowledge of a particular country or area. Comprehensive examination on regional areas is not required.

Language Requirement

Students are expected to achieve a level appropriate to the student's dissertation topic of reading proficiency in at least one foreign language. Proficiency may be verified by examination or by certification by thesis supervisor.

Comprehensive Examinations

Students must pass written comprehensive exams in microeconomics, macroeconomics, and econometrics, which will be administered and graded by the economics department.

Dissertation

Candidates must present a dissertation prospectus no later than March of their third year in the doctoral program. They will be examined on their prospectus by their dissertation committee and must complete a dissertation, which makes a substantial and original contribution to knowledge commensurate with the standards of the University of California in order to receive the Ph.D. degree.

Oral Defense

Students will defend their dissertation at a final oral examination, which will be open to the public.

Ph.D. Time Limit Policies

Students must be advanced to candidacy by the end of five years. Total university support cannot exceed six years. Total registered time at UCSD cannot exceed seven years.

The Ph.D. in Political Science and International Affairs

Requirements for Admission

Students who seek admission to the program must have a B.A. or the equivalent from an institution of comparable standing to the University of California. Preference will be given to students with prior academic records of distinction and to those who have a background in one of the fields of emphasis and/or geographical areas covered by the program. GRE scores (verbal, quantitative, and analytical) are required of all applicants. (Indicate code #R4836 UCSD, IR/PS department code #1901.)

A minimum score of 550 on the paper/pencil version and 213 on the computer-based version of the Test of English as a Foreign Language (TOEFL) is required of all international applicants whose native language is not English and whose undergraduate education was conducted in a language other than English. Students who score

below 600 on the paper/pencil and 250 on the computer-based TOEFL examination are strongly encouraged to enroll in an English-as-a-Second-Language Program (ESL) before beginning doctoral work. UCSD Extension offers an excellent ESL program during summer as well as the academic year. For further information, call (858) 534-3400.

The Ph.D. Curriculum

Program of Study

The Ph.D. in political science and international affairs prepares students for research careers in political science, with an emphasis in either international policy analysis or comparative policy analysis. The program combines the analytical skills of political science with political economy, institutional analysis, policy analysis (especially economic policy) and regional training, with special attention to East Asia and/or Latin America.

Course Requirements

The Ph.D. curriculum in political science and international affairs is designed to provide students with basic training in the techniques of modern political science, as well as applications to specific policy areas and countries or regions.

Seventeen courses are required prior to advancement to candidacy. There is a common core sequence, consisting of comparative public policy, two courses in comparative politics, two courses in international relations and research design. Each student must declare a primary field of either international policy analysis (IPA) or comparative policy analysis (CPA), consisting of three specialized courses. There is also a regional focus of five courses. Three additional courses must be taken from a set of electives.

Regional Requirement

The regional focus consists of international relations of Asia Pacific or international relations of the Americas (depending on which region is the student's primary region), three additional courses in the student's primary region, and one course in another region offered by either IR/PS or the Department of Political Science are required. By petition, students may count a region other than one of the IR/PS offerings (currently China, East Asia, Japan, Latin America, or South-east Asia) as their primary region.

Language Requirement

All students in the program are required to meet a high standard of proficiency in a foreign language before being advanced to candidacy. The language must be linked to the student's region.

Seminar Papers

Each student must submit two seminar papers, one in each field. The penultimate draft of each seminar paper must be completed prior to taking the appropriate field exam, and the final draft must be completed by the end of the quarter in which the exam is taken. Both papers must demonstrate knowledge of the student's regional focus, as well as knowledge of relevant theory in the field. At least one of the papers must also demonstrate knowledge of a substantive policy area, related to the student's primary focus field.

Comprehensive Examinations

Each student must pass two comprehensive examinations, one in international relations and one in comparative politics. Each exam will be graded by a joint committee consisting of three permanent faculty members, with at least one from political science and at least one from IR/PS.

The primary field exam contains a focus field, which may be either a substantive field of policy analysis (e.g. trade, environment, international finance) or the student's chosen primary region. Regardless of focus field, that part of the exam will test the student's knowledge of theoretical literature and ability to apply it to a policy issue of relevance to the region.

Dissertation

Candidates must present a dissertation prospectus to be examined by their dissertation committee, and must complete a dissertation which makes a substantial and original contribution to knowledge commensurate with the standards of the University of California in order to receive the Ph.D. degree. The dissertation committee shall consist of four faculty members chosen from the Department of Political Science and IR/PS, with at least one from each unit. A fifth member must be from outside the department and IR/PS.

Oral Defense

Students will defend their dissertation at a final oral examination, which will be open to the public.

Ph.D. Time Limit Policies

Students must be advanced to candidacy by the end of the fourth year. Total university support cannot exceed seven years. Total registered time at UCSD cannot exceed eight years.

The Ph.D. in International Affairs

Pending final approval of the joint Ph.D. degree programs in economics and international affairs, and political science and international affairs, no future admissions will be made to the Ph.D in International Affairs Program.

International Career Associates Program

The International Career Associates Program (ICAP) is designed for working professionals seeking additional exposure to the various areas of international management, international relations, and comparative public policy.

Participants in the program spend from one quarter to one academic year at IR/PS. Under the auspices of the program, professionals have an opportunity to further internationalize their knowledge and experience, as well as enhance their professional development in areas such as finance, management, marketing, accounting, quantitative methods, econometrics, long-range strategic planning, international affairs, and comparative decision-making. The program of study is tailored to individual interests under the guidance of the program's director and faculty advisers.

ICAP offers:

- An individualized program leading to a Certificate of Study
- An optional prep program in August.
- Opportunities to interact with world-renowned Pacific Rim scholars and policymakers
- Special seminars and lectures by academics and professionals
- ICAP-sponsored cultural events and field trips to local, state, and federal organizations and government offices

For further information, contact the International Career Associates Program office at (858) 534-7420.

The Korea-Pacific Program

The Korea-Pacific Program was formed in September 1989 in recognition of the growing

importance of Korea in the world, of Korean-U.S. relationships, and of the Korean model of social and economic development.

Directed by IR/PS Professor Stephan Haggard, the program promotes the understanding of Korea in an international context and encourages the study of Korea by offering courses on the country's economics and politics. Research is supported on contemporary Korean political economy. Outreach to the community is offered through seminars, lectures, courses, and cultural events.

In comparison with other Korean studies programs in the United States, the IR/PS Korea-Pacific Program is distinctive in several respects: it concentrates on contemporary Korea, focuses on policy questions, stresses the foundations of Korean economic growth, explores Korea's international relations, and seeks to understand Korea in a broad regional context.

The ASEAN-Pacific Project

The ASEAN-Pacific Project is one of several major regional and theme-based nodes of activity within the Graduate School of International Relations and Pacific Studies. Its mandate is to support students and to serve as a catalyst for the development of Southeast Asia-related teaching and research activities within the school. The director of the project is Associate Professor Andrew MacIntyre.

The ASEAN-Pacific Project extends the success of the school's original Vietnam-Pacific Project, with scope being broadened to embrace the other countries of Southeast Asia.

The project is built upon private donations to the school, with this resource being supplemented by resources obtained from external grant agencies and the university. The project supports the activities of students at IR/PS with an interest in Southeast Asia through fellowships (for summer travel and internships) and visiting guests speakers.

The project also serves as a catalyst and facilitator for research projects within the school relating to Southeast Asia. It seeks to promote disciplinary-driven work on political and economic topics pertaining to Southeast Asia, as distinct from more traditional area studies scholarship. Examples of this include recent work on national political institutions and policy-making, the dynamics of regional cooperation, food and agricultural policies, and the relocation of the global magnetic disk-drive industry to Southeast Asia. Other recent research-related initiatives include a major international workshop for Ph.D. students in political science working on Southeast Asia, and a workship for the U.S. Agency for International Development on political conflict in Indonesia.

COURSES

IRPS 87. Freshman Seminar (1)
The Freshman Seminar Program is designed to provide new students with the opportunity to explore an intellectual topic with a faculty member in a small seminar setting. Freshman seminars are offered in all campus departments and undergraduate colleges, and topics vary from quarter to quarter. Enrollment is limited to 15–20 students, with preference given to entering freshmen.

MPIA CORE CURRICULUM

IRCO 400. Policy-Making Processes (4)
This course is designed to teach students how to "read" a country's political and economic system. The course will examine how the evolution of different institutional frameworks in the countries of the Pacific region influences the way in which political choices are made.

IRCO 401. Managerial Economics (4)
Survey of basic tools in economics. Examination of how commodity demand is determined, what affects supply of the commodity, how price is determined, when optimal market allocation of resources and failure occurs, and basic topics concerning the aggregate economy.

IRCO 403. International Economics (4)
The theory and mechanics of international economics. Included will be such topics as real trade theory, international movements of capital, the effects of trade and capital flows on domestic economies, and policies toward trade and foreign investment.

IRCO 410. International Politics and Security (4)
Development of analytic tools for understanding international relations with applications to contemporary problems such as the environment, nuclear proliferation, human rights, humanitarian interventions, and the roots of conflict and cooperation among countries.

IRCO 412. Globalization, the World System, and the Pacific (4)
This course examines globalization and other economic and political factors that shape the international relations of the Pacific Rim. Specific topics include financial market integration, state cooperation and intervention, and case studies of individual countries.

IRCO 420. Accounting (4)
An introduction to financial accounting designed to prepare students to understand their own organizations' international operations and interpret information from outside organizations. The emphasis will be on understanding the potential uses and limitations of accounting information for various management purposes, and the procedural aspects of accounting will be introduced only to the extent necessary to explicate the basic concepts.

IRCO 421. Finance (4)
This course surveys the financial problems facing managers and analyzes financial institutions, financial instruments, and capital markets. Tools acquired will prepare students to analyze international financial topics such as exchange rate behavior, the management of international risk, and international financing. *Prerequisites: IRCO 420, 453, and 454.*

IRCO 453. Quantitative Methods: Decision Making and Scenario Analysis (2)
This course is designed to provide proficiency in quantitative methods that are used for optimization and decision making. It first develops graphic and analytical solutions to resource allocation and efficient production. Next, scenario analysis and elements of decision making under uncertainty are introduced. Finally, the use of spreadsheets is applied to data analysis and problem solving.

IRCO 454. Quantitative Methods: Decision Making under Uncertainty (2)
This course covers elements from statistics that are central to business decision making under uncertainty. In particular, regression analysis and estimation will be applied to problems of forecasting and optimization.

IRCO 460. Managerial Decision Making (4)
This course develops practical decision-making skills useful in a management setting. It stresses identifying relevent information and presenting it effectively. Skills include strategic analysis, negotiation, and application of quantitative methods. *Prerequisites: IRCO 400, 401, 410, 411, 420, 421, 453 and 454.*

IRCO 461. Business and Government in the Global Economy (4)
Business and government interaction in the world economy are examined from both public policy and private sector management perspectives. Topics include competitive advantage, the challenging boundaries of private and public, and the influence of private interests on public sector regulation. *Prerequisites. IRCO 400, 401, 410, 411, 420, 421, 453, 454 and 460, or consent of instructor.*

IRCO 462. Public Policy Workshop (4)
Presents tools for analysis of public policies. Students collaborate on term-long projects analyzing public policy formation, implementation, and outcomes.

GENERAL COURSES

Not all general courses are offered each year.

IRGN 400. International Relations of Asia-Pacific (4)
International relations and developing international political economies of nations bordering the Pacific. Topics include: the "Pacific Basin" concept; the U.S. and "hegemonic-stability" theory; legacies of the Korean War and Sino-Soviet dispute; immigration patterns and their consequences; and Japan's foreign policy.

IRGN 401. Ethnic Conflict (4)
Explanations for why ethnic conflicts break out, why they are difficult to resolve, and what effect outside intervention has on them. Introduce students to the major theories of ethnic and internal conflict. Policy debates regarding how the international community can best respond to these conflicts.

IRGN 402. International Political Economy: Money and Finance (4)
Examination of effects of national policies and international collaboration on public and private interna-

tional financial insitutions, in particular the management of international debt crises, economic policy coordination, and the role of international lender of last resort. *Prerequisite: IRCO 411 or consent of instructor.* Conjoined with Political Science 144D and 262.

IRGN 404. Chinese Politics (4)
This course will analyze post-1949 Chinese politics, including political institutions, the policy making process, and citizen political behavior. Special attention will be given to the prospects for political reform in China.

IRGN 405. U.S.–China Relations (4)
Can the United States and China manage to develop a constructive relationship or are they headed toward a hostile relationship? This course addresses this question by examining the domestic and international influences on the foreign policies of both countries and key issues in the bilateral relationship. Students also do policy projects.

IRGN 408. Internal Conflict after the Cold War (4)
Will examine the causes of civil wars and the problems with resolution and state reconstruction. Theoretical approaches discussed will then be applied to three recent case studies: Cambodia, Rwanda, and Bosnia. Policy implications for the international community will be discussed. *Prerequisite: IRCO 410.*

IRGN 409. Economic Policy in Latin America (4)
This course seeks to enhance the students' understanding of the main policy alternatives open to the largest Latin American countries. Development and stabilization policies are analyzed, emphasizing the current debate between conventional and heterodox policy packages and their impact on decisionmaking. *Prerequisites: IRCO 401, IRCO 403.*

IRGN 411. Business and Management in Japan (4)
This course introduces the main aspects of Japanese business and industrial organization (keiretsu), Japanese management practices, and the representation and influence of business interests in the Japanese political economy.

IRGN 412. The Politics of International Competitiveness (4)
Examination of policy debates concerning international economic relations: what policies promote or encourage effective participation in the international economy, and what political factors support or oppose such policies. Examples are drawn from the experiences of the U.S., Japan, Europe, Latin America, and East Asia.

IRGN 416. Post War Politics in Japan (4)
Overview of postwar politics in Japan, including American Occupation reforms, political institutions, major political factors, mass and elite, and political behavior. Special attention will be paid to the issue of Japan's changing democracy.

IRGN 417. Microfinance (4)
This course will begin by examining financial markets in poor countries. Investigates how micro-finance contracts overcome problems, which had previously barred the extension of business credit in many environments.

IRGN 418. Trade and Economic Growth: Lessons from Pacific Basin Economies (4)
The purpose of this course is to survey economic relations among Pacific Basin economics, exploring relevant economic and public policy issues. Major topics include: productivity; trade; technology spill-over/ transfer; foreign direct investment; factor and human capital accumulation; income distribution; and regional insitutional arrangments. *Prerequisites: IRCO 401 and 403.*

IRGN 419. Risk Management (4)
This course provides an introduction to derivative assets such as options, futures, and swap contracts. The main emphasis is on their valuation, use in hedging, and role as components of liabilities that mitigate risk and agency problems in business firms. *Prerequisite: IRCO 421.*

IRGN 420. Strategic Marketing Planning (4)
This course develops the micro-economic foundations of market exchange by explicitly examining the marketing details of transactions: demand and product differentiation, incomplete and incorrect information, search costs and promotion costs. It is argued that within this theoretical framework (i.e., model) most observed marketing behavior can be reconciled. The primary objective of this course is to learn to deduce firm and consumer motives from observed behavior. *Prerequisites: IRCO 401 and 403, or consent of instructor.*

IRGN 422. Investments (4)
An analysis of the risk/return characterics of different assets as perceived by different investors and their implications for security price behavior, emphasizing real world capital market behavior. International aspects include the role of exchange rate risk and international diversification. *Prerequisites: IRCO 421, 453, and 454, or consent of instructor.*

IRGN 424. Corporate Finance (4)
The topics covered are dividend policy and capital structure, options, debt financing, and short- and long-term financial planning. Course format will consist mostly lectures, with occasional cases. Some international aspects of corporate finance will also be discussed. *Prerequisites: IRCO 401, 403, 420, 421, 453, and 454, or consent of instructor.*

IRGN 425. Managing Service Operations (4)
The course covers (1) strategic issues such as service revision, market positioning, growth, and globalization; (2) process design, facility design, and capacity planning; (3) system control and performance measurement; and (4) human resources, information technology, and other service media. *Prerequisites: IRCO 460 and either IRGN 438 or permission of instructor.*

IRGN 426. Management of Technology (4)
How companies choose and develop new technology. Case studies, lectures by executives. National technology policy, including the roles of intellectual property. This course emphasizes technology strategy at corporate/ national level; the Product Development course emphasizes tactics for developments teams.

IRGN 427. Competition and Regulation in the Global Communications Market (4)
This course explores the global market for telecommunications, Internet, and information services. It analyzes how regulation and international trade rules influence market structure and conduct. It examines the politics underlying government rules. And it probes the strategies of corporations in the global market.

IRGN 429. The Globalization of Production (4)
This course examines how trade policy, information technology, and other factors shape the production strategies of multinational enterprises. Topics include foreign direct investment and the mode of entry into foreign markets, global outsourcing and the globalization of work, and the impact of trade and investment policy on the world location of production. *Prerequisites: IRCO 401 and 403, or consent of instructor.*

IRGN 430. Globalization (4)
An examination of ideas about economic globalization on production "chains": the division of products into components and their distribution around the world.

IRGN 431. Fiscal and Monetary Policy (4)
Effects of fiscal and monetary policies on aggregate variables such as output, nominal and real interest rates, price level, and employment. Additional topics include the inflation/unemployment trade-off, budget deficit, and economic growth.

IRGN 432. Immigration and Immigration Policy (4)
This course examines the role of immigration in the globalization of Pacific Rim economies. Topics include the economic forces behind immigration; the impact of immigration on wages, employment, and industry structure in sending and receiving countries; and the nature, scope, and political economy of immigration policy. *Prerequisites: IRCO 401 or consent of insturctor.*

IRGN 433. International Finance (4)
The international financial system will be addressed, including the perspectives of individual investors, borrowers, and financial intermediaries. Public policy issues including the exchange rate mechanism, financial linkages among countries, optimum currency areas and macro-policy coordination will be discussed. *Prerequisites: IRCO 403, 421, or consent of instructor.*

IRGN 434. Strategic Analysis (4)
This course analyzes competitive interactions, surveying the modern economic analysis of relationships between and within organizations. The foundations of the course are game theory and the economics of information. Topics include bargaining and contracting, principal-agent models, and bidding models.

IRGN 435. Topics in International Trade (4)
This course develops new analytical tools and examines their relevance for trade policy. Topics include setting trade policy where firms have global market power; the interaction between international trade, innovation, and economic growth; regional economic policy, dynamic industry clusters, and information technology; and new trade theory and the world distribution of income. *Prerequisites: IRCO 401 and 403, or consent of instructor.*

IRGN 436. Information and Management (4)
This is a seminar course on the use of information by organizations in strategic and tactical decision-making. Actual content varies, and currently includes doing business on the Internet and supply chain management. *Prerequisite: IRCO 460.*

IRGN 438. Production and Operations Management: Analysis and Control (4)
This course provides a comprehensive introduction to the fundamental decisions and trade-offs associated with the control of a firm's operations function. It analyzes production processes, quality control, inventory and materials planning, kanban and just-in-time principles. *Prerequisites: IRCO 453 and 454, or consent of instructor.*

IRGN 440. Managerial Accounting and Control (4)
Focus on planning, managing, controlling and evaluating costs for competitive advantage in global markets.

Key topics will include cost structure, cost-based managerial decision making, strategic cost management, JIT/TQC cost management, and accounting control systems. *Prerequisite: IRCO 420 or consent of instructor.*

IRGN 443. Economics of Telecommunications (4)
This course will focus on the underlying economics of the telecommunications and public policy rationale of regulations applied to this industry. Both theoretical models and case studies will be used to provide better understanding of the telecommunication marketplace and the nature of competition between service providers in the industry. *Prerequisite: IRCO 401 or consent of instructor.*

IRGN 444. Product Development (4)
This course examines how high-tech companies develop successful products. Emphasizes interplay between business and technology issues, including marketing, finance, manufacturing, prototyping, testing, and design. Student teams develop novel products, from concept to working prototype, including a business plan for launching the product. Discussion of concurrent engineering, rapid prototyping, industrial design, and other design methodologies.

IRGN 446. Applied Data Analysis and Statistical Decision Making (4)
The goal of the course is to teach how to evaluate quantitative information in business and economics contexts, and to make sound managerial decisions in complex situations. Much of the problems and course work will involve statistical software and spreadsheet analysis of data. The course covers various applied multivariate statistical methods beyond basics. *Prerequisites: IRCO 453 and 454, or consent of instructor.*

IRGN 447. Organizations (4)
A seminar course based on the modern economics of organization. Covers an eclectic set of readings on a diverse range of organizations, looking at how incentives for collective action are structured. *Prerequisites: IRCO 401 and 403 or consent of instructor.*

IRGN 449. Making U.S. Foreign Policy (4)
Analysis of the interests, structure and procedures of the main executive branch agencies involved in the formulation of foreign policy, and of the roles of Congress, the media, public opinion, and non-governmental actors. Case studies and "daily briefings" to prepare students to perform professionally in the foreign policy arena. *Prerequisite: IRCO 410 or consent of instructor.*

IRGN 451. Economic Development (4)
This course examines comparative patterns of industrialization and agricultural modernization with a focus on certain common features of the modernization process and widely varying endowments, policies, and experiences of different countries. *Prerequisites: IRCO 401 and 403, or consent of instructor.*

IRGN 453. Sustainable Development (4)
The course will cover the concept of sustainable development, ways in which sustainable development can be measured, evaluation of environmental damages and benefits, and the role of discounting, and will analyze cases demonstrating failure of the market.

IRGN 454. Current Issues in U.S.-Latin American Relations (4)
Issues to be actively debated include the collective defense of democracy, coping with revolutionary change, counter-narcotics, anti-corruption, international finance, trade, and U.S.-Mexican and U.S.-Brazilian relations. In each case, students analyze the strengths and weaknesses of current U.S. policy and advocate alternative options. *Prerequisite: IRCO 410 or consent of instructor.*

IRGN 455. Economic Theories of Regional Integration (4)
The first part of the course covers the basic economics of trading blocs and proceeds to more complicated topics in the theory of preferential trading arrangements, customs unions, and currency unions. In the second part we use the formal theory to compare economic integration in different parts of the world. *Prerequisites: IRCO 401 and 403 or consent of instructor.*

IRGN 456. Program Design and Evaluation (4)
Introduction to elements of program design and evaluation. Examines principles and guidelines used in creating a program and evaluating its success or failure. International case studies are explored. Students have the opportunity to develop their own program and evaluate projects.

IRGN 457. Cost Benefit Analysis (4)
Examination of public policy analysis, such as cost-benefit analysis and project evaluation, for use in policy formation. Sustainable development will receive particular attention. Case studies emphasizing the environment, agriculture and food, and economic development will be included.

IRGN 458. International Environmental Policy and Politics (4)
This course analyzes multilateral environmental agreements and negotiating positions of key countries on climate change, biodiversity conservation, sustainable development, and other subjects. It explores the challenges countries face to balance economic development objectives with global environmental concerns.

IRGN 459. Conflict Resolution of Environmental Issues (4)
Use of bilateral negotiations (U.S.-Canada), regional organizations (ECE and acid rain in Europe), and United Nations specialized agencies (UNEP and WMO on ozone depletion and climate change) to mediate environmental disputes. Consideration of nontraditional approaches resolving international environmental problems.

IRGN 460. The Politics of U.S.-Japan Economic Relations (4)
This course will analyze how the domestic politics of each country, their international negotiations, and their interaction concerning economic issues have affected the U.S.-Japan relationship. Both the politics of cooperation and integration, and trade friction and conflict will be addressed in part through study of specific cases.

IRGN 461. Doing Business in China (4)
This course describes the Chinese commerical, organizational, and cultural environment. Case studies of foreign businesses in China are examined, and the opportunities and pitfalls of operation in China are considered. Negotiation with Chinese counterparts is covered through a negotiation exercise. The focus is on mainland China, but some attention is given to business in Hong Kong and Taiwan as well. Students are required to prepare business plans for proposed Chinese ventures.

IRGN 463. Political Economy of Southeast Asia (4)
This course provides an introduction to five Southeast Asian countries: Indonesia, Thailand, Malaysia, the Philippines, and Vietnam. The focus will be on national level of political and economic issues in these countries. In addition, a number of region-wide issues will also be examined such as: Chinese business groups and networks; clientelism and corruption; regional trade and investment linkages; democratization; and the implications of political change for future economic development.

IRGN 464. Strategies and Skills for Effective Consulting (4)
This course will provide an introduction to the field of consulting. It will focus both on effective consulting strategies and on skills and tools that are helpful in the process. Technical, cultural, economic, and political issues will be considered, as the various aspects of consultant work are examined

IRGN 465. Management of Non-profit Organizations (4)
Analyzes the particular environment in which non-profit organizations define and achieve their objectives. Management tools are applied to existing non-profits and to student projects.

IRGN 466. Public Finance (4)
Describes principles of taxation and expenditure analysis, public budgeting, and assessment of budget priorities.

IRGN 468. Government and Business in Japan (4)
This course aims to identify and analyze the basic features of the Japanese political economy and government-business relationships in postwar Japan. Following an introduction to the constituents of Japanese political and industrial organization, specific aspects of financial and industrial policy (MOF/MITI) as well as regulation and corporate governance are discussed.

IRGN 469. The Japanese Financial System (4)
This course studies the financial system in Japan and analyzes its role in the development of the Japanese economy. Topics will include *keiretsu* and the main bank system, internationalization and deregulation of finance, the Bank of Japan and monetary policy. *Prerequisites: IRCO 401 and 403.*

IRGN 470. International Business Strategy (4)
This course analyzes corporate strategies and management issues in their international dimensions. Based on numerous case studies, the class examines the strategic opportunities and problems that emerge when companies transfer corporate skills and competence to other countries.

IRGN 471. Japanese Economy (4)
A broad survey of the Japanese economy, together with in-depth examination of some distinctively Japanese phenomena such as savings behavior, financial structure, industrial organization, and labor markets. *Prerequisites: IRCO 401 and 403, or consent of instructor.*

IRGN 472. Japanese Corporate Culture (4)
This course examines Japanese cultural values and social relations in the context of business organizations. The central focus will be on the integration of individuals into their organizations and on the human relations characteristic of their work environments.

IRGN 473. APEC: Regional Integration, Policies and Procedures (4)
This course examines regional integration in the Asia Pacific from historical, institutional, and comparative perspectives. It considers the origins of the Asia Pacific Economic Cooperation (APEC) Forum, the diverse interests of APEC member economies, APEC institutional procedures, the implementations of trade and technical assistance initiatives, and the roles of the private sector and NGOs. Student participation and original research is emphasized.

IRGN 475. International Negotiation (4)
This course attempts to reach a broad audience of students who seek in-depth understanding of how states and other international actors attempt to achieve specific objectives through give-and take of the negotiation process. Cases include Northern Ireland and Middle East peace processes, negotiations leading to Dayton accords, and negotiations over Antiballistic Missile Treaty.

IRGN 476. Doing Business in Latin America (4)
Explores the realities of conducting business in Latin America. The focus will be on discussing a variety of cases, mainly in four countries—Mexico, Brazil, Argentina and Chile—covering strategic, operational, organizational, and cross-cultural issues. Course format will consist of case studies and will include the development and presentation of a business plan.

IRGN 477. Latin American Politics (4)
Introductory reading seminar on Latin American politics to acquaint students with leading schools of thought, provide critical perspective on premises and methodology, and identify themes for further inquiry. Themes include authoritarianism, revolution, democratization, regional conflict, and emergence of middle-level powers.

IRGN 479. Politics and Institutions in Latin America (4)
Overview of Latin American politics and the "rules of the game," both formal and informal. Key topics include military rule, presidentialism, and clientelism in the region as a whole, with special emphasis on Argentina, Brazil, Chile, and Mexico. *Prerequisite: IRCO 400 or consent of instructor.*

IRGN 480. Policy-Making in Latin America (4)
Major policy issues in contemporary Latin America, especially the breaakdown of import substitution and subsequent liberalization of economics. Special attention is given to the coalition strategies of politicians and the capacity of state institutions to deliver public goods. *Prerequisite: IRGN 479 or consent of instructor.*

IRGN 481. Managing Country Risk in the Modern Multinational Corporation (4)
Examines ways to analyze, assess, and reduce country risk.

IRGN 482. East Asian NICS (4)
Forces explaining the success of four economies in East Asia (South Korea, Taiwan, Hong Kong, Singapore), and two natural resource-rich states (Malaysia, Thailand) will be addressed. Theoretical models, implementation of development policies/strategies, and sociopolitical causes and consequences of development will be discussed. *Prerequisites: IRCO 401 and 403, or IRCO 410 and 411, or consent of instructor.*

IRGN 483. Business and Policy in Southeast Asia (4)
Surveys various dimensions of business in Southeast Asia, with particular attention to the policy context. Special focus on technological capabilities of business organizations in Southeast Asia. *Prerequisite: Economies in Southeast Asia or consent of instructor.*

IRGN 484. Korean Politics (4)
This course will examine characteristics and distinctive aspects of contemporary Korean society and politics. Emphasis will be placed on continuity and change in social values, political culture and leadership, economic growth and its impact, and democratization and its future prospects.

IRGN 485. The Korean Economy (4)
Analytical review of South Korea's economic performance. Examination of major policy changes (e.g., shifts toward export promotion, heavy and chemical industrial promotion); Korea's industrial structure including the role of large enterprises (chaebol); role of government; links between Korea and other countries.

IRGN 486. Economic and Social Development of China (4)
This course examines China's development experience from a generally economic standpoint. Contents include: patterns of traditional Chinese society and economy; geography and resource constraints; impact of the West and Japan; development since 1949; and contemporary problems and options.

IRGN 487. Applied Environmental Economics (4)
This course teaches students how to analyze environmental and natural resource policy issues in developing countries using economic concepts and methods. Weekly spreadsheet exercises based on real-world data provide hands-on practice. *Prerequisites: IRCO 401, 453, 454, or consent of instructor.*

IRGN 488. Corporate Strategy and the Environment (4)
This seminar examines the ability of firms to increase shareholder value through improved environmental performance. Topics innclude product differentiation, strategtic use of regulations, the "Porter hypothesis," and environmental management systems. Readings include case studies and research articles. *Prerequisites: IRCO 401, 421, 453, 454, or consent of instructor.*

IRGN 490. Special Topics in Pacific International Affairs (4)
A seminar course at an advanced level on a special topic in Pacific international affairs. May be repeated for credit.

IRGN 497. Internship (4-12)
Field research in an area relevant to career and/or regional specialization. May be repeated for credit.

IRGN 498. Directed Group Study (2-12)
Directed reading in a selected area. The content of each course is to be decided by the professor directing the course with the approval of the student's faculty adviser. May be repeated for credit.

IRGN 499. Independent Research (2-12)
Independent research under the guidance of a faculty member at IR/PS. May be repeated for credit.

LANGUAGE COURSES

IRLA 3A-B-C. First-Year Vietnamese: Vietnamese Conversation (2-2-2)
This course consists of tutorial meetings to provide additional training and practice in Vietnamese conversation. This course must be taken with IRLA 3AX-BX-CX. *Prerequisites: consent of instructor and department stamp.*

IRLA 3AX-BX-CX. First-Year Vietnamese: Analysis of Vietnamese (3-3-3)
This course provides an introduction to the phonology, orthography, morphology, and syntax of the Vietnamese language. The course format consists of lectures and practice. This is a course for students with no Vietnamese background. Must be taken with IRLA 3A-B-C. *Prerequisites: consent of instructor and department stamp.*

IRLA 4A-B-C. Beginning Portuguese: Portuguese Conversation (4-4-4)
Presentation and practice of basic grammatical structures needed for oral and written communication of Portuguese. Emphasis on listening comprehension, speaking, vocabulary building, reading, and culture. For students with no Spanish background.

IRLA 5A-B-C. Portuguese Language for Spanish Speakers (4-4-4)
This course is designed to introduce undergraduate Spanish-speaking students to the Portuguese language through a combination of classes, exercises, and other language experiences. *Consent of instructor is necessary.*

IRLA 34A-B-C. Vietnamese for Bilingual Speakers (4-4-4)
This course is for those students who have a high level of speaking proficiency in Vietnamese but little or no reading and writing abilities. Special emphasis in the development of reading and writing skills. *Prerequisite: consent of instructor.*

IRLA 145A-B-C. Vietnamese Language and Civilization (4-4-4)
Introduction to Vietnamese culture from the sixteenth century to the present through reading Vietnamese texts regarding religion, politics, economics, and history. This course is for students who have an intermediate level of speaking, reading, and writing abilities in Vietnamese. *Prerequisites: prior ability to read, write, and speak Vietnamese language, department stamp.*

IRLA 400A-B-C. Chinese Language for Professional Proficiency (4-4-4)
This course is designed to enable students at a *low-intermediate* level of proficiency to maintain and improve their Chinese language skills through a combination of classes, language laboratories, exercises, and other language experiences. *Prerequisite: IR/PS majors only, or by consent of instructor.*

IRLA 401A-B-C. Chinese Language for Professional Proficiency (4-4-4)
This course is designed to enable students at an *intermediate* level of proficiency to maintain and improve their Chinese language skills through a combination of classes, language laboratories, exercises, and other language experiences. Prerequisite: *IR/PS majors only, or by consent of instructor.*

IRLA 402A-B-C. Chinese Language for Professional Proficiency (4-4-4)
This course is designed to enable students at an *advanced-intermediate* level of proficiency to maintain and improve their Chinese language skills through a combination of classes, language laboratories, exercises, and other language experiences. *Prerequisite: IR/PS majors only, or by consent of instructor.*

IRLA 403A-B. Chinese Language for Professional Proficiency (4-4)
This course is designed to enable students at an *advanced* level of proficiency to maintain and improve their Chinese language skills through a combination of classes, language laboratories, exercises, and other language experiences. *Prerequisite: IR/PS majors only, or by consent of instructor.*

IRLA 406A-B-C. Technical Chinese Language (4,4,4)
A course designed to prepare IR/PS technical management track students to meet the language competency requirement in Chinese. Acquisition of technical language skills through classes, language, language laboratory, exercises, and other activities. *Prerequisite:*

IR/PS technical concentration admission status or by consent of instructor.

IRLA 410A-B-C. Japanese Language for Professional Proficiency (4-4-4)
This course is designed to enable students at a *low-intermediate* level of proficiency to maintain and improve their Japanese language skills through a combination of classes, language laboratories, exercises, and other language experiences. *Prerequisite: IR/PS majors only or by consent of instructor.*

IRLA 411A-B-C. Japanese Language for Professional Proficiency (4-4-4)
This course is designed to enable students at an *intermediate* level of proficiency to maintain and improve their Japanese language skills through a combination of classes, language laboratories, exercises, and other language experiences. *Prerequisite: IR/PS majors only, or by consent of instructor.*

IRLA 412A-B-C. Japanese Language for Professional Proficiency (4-4-4)
This course is designed to enable students at an *advanced-intermediate* level of proficiency to maintain and improve their Japanese language skills through a combination of classes, language laboratories, exercises, and other language experiences. *Prerequisite: IR/PS majors only, or by consent of instructor.*

IRLA 413A-B-C. Japanese Language for Professional Proficiency (4-4-4)
This course is designed to enable students at an *advanced* level of proficiency to maintain and improve their Japanese language skills through a combination of classes, language laboratories, exercises, and other language experiences. *Prerequisite: IR/PS majors only, or by consent of instructor.*

IRLA 416A-B-C. Technical Japanese Language (4,4,4)
A course designed to prepare IR/PS technical management track students to meet the language competency requirement in Japanese. Acquisition of technical language skills through classes, language laboratory, exercises, and other activities. *Prerequisite: IR/PS technical concentration admission status or by consent of instructor.*

IRLA 417. Introduction to Kanji (2)
Introduction to the characteristics and usage of Chinese characters (Kanji) used in Japanese language: history, structure, cognitive aspects, their relationship with hiragana and katakana, policy issues, learning strategies, and technology. *Prerequisite: basic knowledge of Japanese grammar and consent of instructor, IR/PS majors.*

IRLA 418. Strategies for Reading Japanese (2)
This course introduces effective and efficient strategies for reading advanced-level professional texts in Japanese: analysis of extended sentence structure and multiple predicate sentences and development of strategies for skimming, scanning, and intensive reading of Japanese texts. *Prerequisite: basic knowledge of Japanese grammar and writing system and consent of instructor, IR/PS majors.*

IRLA 420A-B-C. Korean Language for Professional Proficiency (4-4-4)
This course is designed to enable students at a *low-intermediate* level of proficiency to maintain and improve their Korean language skills through a combination of classes, language laboratories, exercises, and other language experiences. *Prerequisite: IR/PS majors only or by consent of instructor.*

IRLA 421A-B-C. Korean Language for Professional Proficiency (4-4-4)
This course is designed to enable students at an *intermediate* level of proficiency to maintain and improve their Korean language skills through a combination of classes, language laboratories, exercises, and other language experiences. *Prerequisite: IR/PS majors only, or by consent of instructor.*

IRLA 430A-B-C. Portuguese Language for Spanish Speakers (4-4-4)
This course is designed to enable Spanish-speaking students to acquire proficiency in the Portuguese language through a combination of classes, language laboratories, exercises, and other language experiences. Prerequisite: *IR/PS majors only or by consent of instructor.*

IRLA 431A-B-C. Second Year Portuguese Language for Spanish Speakers (4-4-4)
A continuation of first-year Portuguese for Spanish speakers. This course is designed to enable Spanish-speaking students to be introduced to an *intermediate* level of Portuguese language through a combination of classes, language, laboratories, exercises, and other language experiences. *Prerequisite: IR/PS majors only or by consent of instructor.*

IRLA 440A-B-C. Spanish Language for Professional Proficiency (4-4-4)
This course is designed to enable students at a *low-intermediate* level of proficiency to maintain and improve their Spanish language skills through a combination of classes, language laboratories, exercises, and other language experiences. *Prerequisite: IR/PS majors only or by consent of instructor.*

IRLA 441A-B-C. Spanish Language for Professional Proficiency (4-4-4)
This course is designed to enable students at an *intermediate* level of proficiency to maintain and improve their Spanish language skills through a combination of classes, language laboratories, exercises, and other language experiences. *Prerequisite: IR/PS majors only, or by consent of instructor.*

IRLA 442A-B-C. Spanish Language for Professional Proficiency (4-4-4)
This course is designed to enable students at an *advanced-intermediate* level of proficiency to maintain and improve their Spanish language skills through a combination of classes, language laboratories, exercises, and other language experiences. *Prerequisite: IR/PS majors only, or by consent of instructor.*

IRLA 443A-B-C. Spanish Language for Professional Proficiency (4-4-4)
This course is designed to enable students at an *advanced* level of proficiency to maintain and improve their Spanish language skills through a combination of classes, language laboratories, exercises, and other language experiences. *Prerequisite: IR/PS majors only, or by consent of instructor.*

IRLA 444A-B-C. Spanish Language for Professional Proficiency (4-4-4)
This course is designed to enable students at a *superior* level of proficiency to maintain and improve their Spanish language skills through individual training with an instructor. Prerequisite: *IR/PS majors only, or by consent of instructor.*

IRLA 446A-B-C. Technical Spanish Language (4,4,4)
A course designed to prepare IR/PS technical management track students to meet the language competency requirement in Spanish. Acquisition of technical language skills through classes, language laboratory, exercises, and other activities. *Prerequisite: IR/PS technical concentration admission status or by consent of instructor.*

IRLA 450A-B-C. Vietnamese Language for Professional Proficiency (4-4-4)
This course is designed to enable students at a *low-intermediate* level of proficiency to maintain and improve their Vietnamese language skills through a combination of classes, language laboratories, exercises, and other language experiences. *Prerequisite: IR/PS majors only or by consent of instructor.*

IRLA 451A-B-C. Vietnamese Language for Professional Proficiency (4-4-4)
This course is designed to enable students at an *intermediate* level of proficiency to maintain and improve their Vietnamese language skills through a combination of classes, language laboratories, exercises, and other language experiences. *Prerequisite: IR/PS majors only, or by consent of instructor.*

IRLA 452A-B-C. Vietnamese Language for Professional Proficiency (4-4-4)
This course is designed to enable students at an *advanced-intermediate* level of proficiency to maintain and improve their Vietnamese language skills through a combination of classes, language laboratories, exercises, and other language experiences. *Prerequisite: IR/PS majors only, or by consent of instructor.*

IRLA 460A-B-C. Bahasa Indonesia for Professional Proficiency (4-4-4)
This course is designed to enable students with basic knowledge and skills of Bahasa Indonesia to further develop communicative skills through a combination of classes, exercises, and other language experiences.

IRLA 490. Special Topics in Language (2-12)
A seminar course at an advanced level on core linguistic functions and topics related to international management and policy work in the Pacific Rim area. *Prerequisite: proficiency examination must be passed.*

IRLA 500. Apprentice Teaching of Language (1-4)
This course, designed for graduate students serving as teaching assistants, includes discussion of teaching theories, techniques, and materials, conduct of discussion sessions, and participation in examinations, under the supervision of the instructor in charge of the course. *Prerequisite: graduate standing.*

PH.D. LEVEL COURSES

IRGN 201. Ethnic Conflict (4)
Explanations for why ethnic conflicts break out, why they are difficult to resolve, and what effect outside intervention has on them. Introduce students to the major theories of ethnic and internal conflict. Policy debates regarding how the international community can best respond to these conflicts.

IRGN 202. International Political Economy: Money and Finance (4)
Examination of effects of national policies and international collaboration on public and private international financial institutions, in particular the management of international debt crises, economic policy coordination, and the role of international lender of last resort. Conjoined with Political Science 262.

IRGN 204. International Relations of the Pacific (4)
International relations and developing international political economies of nations bordering the Pacific.

Topics include: the "Pacific Basin" concept; the U.S. and "hegemonic-stability" theory; legacies of the Korean War and Sino-Soviet dispute; immigration patterns and their consequences; and Japan's foreign policy.

IRGN 205. U.S.–China Relations (4)
Can the United States and China manage to develop a constructive relationship or are they headed toward a hostile relationship? This course addresses this question by examining the domestic and international influences on the foreign policies of both countries and key issues in the bilateral relationship. Students also do policy projects.

IRGN 206. Corporate Strategy and the Environment (4)
This seminar examines the ability of firms to increase shareholder value through improved environmental performance. Topics include product differentiation, strategic use of regulations, the "Porter hypothesis," and environmental management systems. Readings include case studies and research articles. *Prerequisites: IRCO 401, 421, 453, 454, or consent of instructor.*

IRGN 207. Bureaucracy and Public Policy (4)
What determines the degree of influence bureaucrats exert over public policy outcomes, versus the influence of politicians? Overview of themes such as developmental state, state autonomy, legislative oversight, clientelism, corruption. Applications to Japan, East Asia, United States, and Latin America. *Prerequisites: IP/Core 400 or consent of instructor; PS 228, graduate standing, or consent of instructor.*

IRGN 208. Internal Conflict after the Cold War (4)
Will examine the causes of civil wars and the problems with resolution and state reconstruction. Theoretical approaches discussed will then be applied to three recent case studies: Cambodia, Rwanda, and Bosnia. Policy implications for the international community will be discussed. *Prerequisites: IRGN 210.*

IRGN 209. Strategic Marketing Planning (4)
This course develops the microeconomics foundations of market exchange by explicitly examining the marketing details of transactions: demand and product differentation, incomplete and incorrect information, search costs and promotion costs. It is argued that within this theoretical framework (i.e., model) most observed marketing behavior can be reconciled. The primary objective of this course is to learn to deduce firm and consumer motives from observed behavior. *Prerequisites: IRGN 221 and 243, or consent of instructor.*

IRGN 210. International Politics and Security (4)
Development of analytic tools for understanding international relations with applications to contemporary problems such as the environment, nuclear proliferation, human rights, humanitarian interventions, and the roots of conflict and cooperation among countries.

IRGN 212. The Politics of International Competitiveness (4)
Examination of policy debates concerning international economic relations: what policies promote or encourage effective participation in the international economy, and what political factors support or oppose such policies. Examples drawn from the experiences of the U.S., Japan, Europe, Latin America, and East Asia.

IRGN 213. Risk Management (4)
This course provides an introduction to derivative assets such as options, futures, and swap contracts. The main emphases is on their valuation, use in the hedging, and role as components of liabilities that mitigate risk and agency problems in business firms. *Prerequisite: IRCO 421.*

IRGN 215. Competition and Regulation in the Global Communications Market (4)
This course explores the global market for telecommunications, Internet, and information services. It analyzes how regulation and international trade rules influence market structure. It examines the politics underlying government rules, and it probes the strategies of corporation in the global market.

IRGN 216. Post War Politics in Japan (4)
Overview of postwar politics in Japan, including American Occupation reforms, political institutions, major political actors, mass and elite, and political behavior. Special attention will be paid to the issue of Japan's changing democracy.

IRGN 217. Microfinance (4)
This course will begin by examining financial markets in poor countries. Investigates how microfinance contracts overcome problems, which had previously barred the extension of business credit in many environments.

IRCO 218. Globalization, the World System, and the Pacific (4)
This course examines globalization and other economic and political factors that shape the international relations of the Pacific Rim. Specific topics include financial market integration, state cooperation and intervention, and case studies of individual countries.

IRGN 219A-B-C. Workshop in International Relations (4,4,4)
Examination of recent research in international politics; development and presentation of research projects by graduate students; presentation of research projects by faculty. Second year students present seminar paper; third year students present dissertation prospectus; candidates make yearly presentation of dissertation research. *Prerequisite: Political Science 202 or consent of instructor.* Conjoined with Political Science 202.

IRGN 220. APEC: Integration, Policies and Procedures (4)
This course examines regional integration in the Asia Pacific from historical, institutional, and comparative perspectives. It considers the origins of the Asia Pacific Economic Cooperation (APEC) Forum, the diverse interest of APEC member economies. APEC institutional procedures, the implementation of trade and technical assistance initiatives, and the roles of the private sector and NGOs. Student participation and original research is emphasized.

IRGN 221. Managerial Economics (4)
Survey of basic tools in economics. Examination of how commodity demand is determined, what affects supply of the commodity, how price is determined, when optimal market allocation of resources and failure occurs, and basic topics concerning the aggregate economy.

IRGN 222. Investments (4)
An analysis of the risk/return characteristics of different assets as perceived by different investors and their implications for security price behavior, emphasizing real world capital market behavior. International aspects include the role of exchange rate risk and international diversification.

IRGN 223. The Globalization of Production (4)
This course examines how trade policy, information technology, and other factors shape the production strategies of multinational enterprises. Topics include foreign direct investment and the mode of entry into foreign markets, global outsourcing and the globalization of work, and the impact of trade and investment policy on the world location of production. *Prerequisites: IRGN 221 and IRGN 243, or consent of instructor.*

IRGN 224. Corporate Finance (4)
The topics covered are dividend policy and capital structure, options, debt financing, and short- and long-term financial planning. Course format will be mostly lectures with occasional cases. Some international aspects of corporate finance will also be discussed. *Prerequisites: IRGN 221, 243, IRCO 420, 421, 453 and 454, or consent of instructor.*

IRGN 225. Managing Service Operations (4)
This course covers (1) strategic issues such as service revision, market positioning, growth, and globalization; (2) process design, facility design, and capacity planning; (3) system control and performance measurement; and (4) human resources, information technology, and other service media. *Prerequisites: IRCO 460 and either IRGN 438 or permission of instructor.*

IRGN 226. Management of Technology (4)
How companies choose and develop new technology. Case studies, lectures by executives. National technology policy, including the roles of intellectual property. This course emphasizes technology strategy at corporate/national level; the product development course emphasizes tactics for development teams.

IRGN 227. Organizations (4)
A seminar course based on the modern economics of organization. Covers an eclectic set of readings on a diverse range of organizations, looking at how incentives for collective action are structured. *Prerequisites: IRGN 221 and 243 or consent of instructor.*

IRGN 228. Government and Business in Japan (4)
This course aims to identify and analyze the basic features of the Japanese political economy and government-business relationships in postwar Japan. Following an introduction to the constituents of Japanese political and industrial organization, specific aspects of financial and industrial policy (MOF/MITI) as well as regulation and corporate governance are discussed. Additional paper and/or examination will be required at the doctoral level.

IRGN 229. Business and Management in Japan (4)
This course introduces the main aspects of Japanese business and industrial organization (keiretsu), Japanese management practices, and the representation and influence of business interests in the Japanese political economy.

IRGN 230. Trade and Economic Growth: Lessons from Pacific Basin Economies (4)
The purpose of this course is to survey economic relations among Pacific Basin economies, exploring relevant economic and public policy issues. Major topics include: productivity, trade, technology spill-over/transfer, foreign direct investment, factor and human capital accumulation, income distribution, and regional institutional arrangements. *Prerequisites: IRGN 221 and IRGN 243.*

IRGN 231. Fiscal and Monetary Policy (4)
Effects of fiscal and monetary policies on aggregate variables such as output, nominal and real interest rates, price level, and employment. Additional topics include the inflation/unemployment trade-off, budget deficit, and economic growth.

IRGN 232. Immigration and Immigration Policy (4)
This course examines the role of immigration in the globalization of Pacific Rim economics. Topics include the economic forces behind immigration; the impact of immigration on wages, employment, and industry structure in sending and receiving countries; and the nature, scope, and political economy of immigration policy. *Prerequisites: IRGN 221 or permission of instructor.*

IRGN 233. International Finance (4)
The international financial system will be addressed including the perspectives of individual investors, borrowers, and financial intermediaries. Public policy issues including the exchange rate mechanism, financial linkages among countries, optimum currency areas, and macro-policy coordination will be discussed. *Prerequisites: IRGN 243 and IRCO 421, or consent of instructor.*

IRGN 234. Strategic Analysis (4)
This course analyzes competitive interactions, surveying the modern economic analysis of relationships between and within organizations. The foundations of the course are game theory and the economics of information. Topics include bargaining and contracting, principal-agent models, and bidding models.

IRGN 235. Topics in International Trade (4)
This course develops new analytical models of international trade and examines their relevance for trade policy. Topics include setting trade policy where firms have global market power; the interaction between international trade, innovation, and economic growth; regional economic policy, dynamic industry clusters, and information technology; and new trade theory and the world distribution of income. *Prerequisites: IRGN 221 and IRGN 243, or consent of instructor.*

IRGN 236. Information and Management (4)
This is a seminar course on the use of information by organizations in strategic and tactical decision-making. Actual content varies, and currently includes doing business on the Internet and supply chain management. *Prerequisite: IRGN 238 or consent of instructor.*

IRGN 238. Production and Operations Management: Analysis and Control (4)
This course provides a comprehensive introduction to the fundamental decisions and trade-offs associated with the control of a firm's operations function. It analyzes production processes, quality control, inventory and materials planning, kanban, and just-in-time principles. *Prerequisites: IRCO 453 and 454.*

IRGN 240. Applied Data Analysis and Statistical Decision Making (4)
The goal of the course is to teach how to evaluate quantitative information in business and economics contexts and to make sound managerial decisions in complex situations. Much of the problems and the course work will involve statistical software and spreadsheet analysis of data. The course covers various applied multivariate statistical methods beyond basics. *Prerequisites: IRCO 453 and 454.*

IRGN 242. Economics of Telecommunications (4)
This course will focus on the underlying economics of the telecommunications and public rationale of regulations applied to this industry. Both theoretical models and case studies will be used to provide better understanding of the telecommunications marketplace and the nature of competition between service providers in the industry. *Prerequisite: IRGN 221 or consent of instructor.*

IRGN 243. International Economics (4)
The theory and mechanics of international economics. Included will be such topics as real trade theory, international movements of capital, the effects of trade and capital flows on domestic economies, and policies toward trade and foreign investment.

IRGN 244. Product Development (4)
This course examines how high-tech companies develop successful products. Emphasizes interplay between business and technology issues, including marketing, finance, manufacturing, prototyping, testing, and design. Student teams develop novel products, from concept to working prototype, including a business plan for launching the product. Discussion of concurrent engineering, rapid prototyping, industrial design, and other design methodologies.

IRGN 249. Making U.S. Foreign Policy (4)
Analysis of the interests, structure, and procedures of the main executive branch agencies involved in the formulation of foreign policy, and of the roles of Congress, the media, public opinion, and non-governmental actors. Case studies and "daily briefings" to prepare students to perform professionally in the foreign policy arena. *Prerequisite: IRGN 210 or consent of instructor Suggested: IRGN 218 and IRCO 454.*

IRGN 250. The Politics of U.S.-Japan Economic Relations (4)
This course will analyze how the domestic politics of each country, their international negotiations, and their interaction concerning economic issues have affected the U.S.-Japan relationship. Both the politics of cooperation and integration, and trade friction and conflict will be addressed in part through study of specific cases.

IRGN 251. Economic Development (4)
This course examines comparative patterns of industrialization and agricultural modernization with a focus on certain common features of the modernization process and widely varying endowments, policies, and experiences of different countries. *Prerequisites: IRGN 221 and 243, or consent of instructor.*

IRGN 253. Sustainable Development (4)
The course will cover the concept of sustainable development, ways in which sustainable development can be measured, evaluation of environmental damages and benefits, and the role of discounting, and will analyze cases demonstrating failure of the market.

IRGN 254. International Relations Theory (4)
A survey of the principal theories and approaches to the study of international relations.

IRGN 255. Globalization (4)
An examination of ideas about economic globalization. focusing on production "chains": the division of products into components, and their distribution around the world.

IRGN 256. Program Design and Evaluation (4)
Introduction to elements of program design and evaluation. Examines principles and guidelines used in creating a program and evaluating its success or failure. International case studies are explored. Students have the opportunity to develop their own program and evaluate projects.

IRGN 257. Cost Benefit Analysis (4)
Examination of public policy analysis, such as cost-benefit analysis and project evaluation, for use in policy formation. Sustainable development will receive particular attention. Case studies emphasizing the environment, agriculture and food, and economic development will be included.

IRGN 258. International Environmental Policy and Politics (4)
This course analyzes multilateral environmental agreements and negotiating positions of key countries on climate change, biodiversity conservation, sustainable development, and other subjects. It explores the challenges countries face to balance economic development objectives with global environmental concerns.

IRGN 259. Conflict Resolution of Environmental Issues (4)
Use of bilateral negotiations (U.S.-Canada), regional organization (ECE and acid rain in Europe), and United Nations specialized agencies (UNEP and WMO on ozone depletion and climate change) to mediate environmental disputes. Consideration of nontraditional approaches resolving international environmental problems.

IRGN 260. Economic and Social Development of China (4)
This course examines China's development experience from a generally economic standpoint. Contents include: patterns of traditional Chinese society and economy, geography and resource constraints, impact of the West and Japan, development since 1949, and contemporary problems and options.

IRGN 261. Chinese Politics (4)
This course will analyze post-1949 Chinese politics, including political institutions, the policymaking process, and citizen political behavior. Special attention will be given to the prospects for political reform in China.

IRGN 262. Comparative Public Policy: A Political Economy Approach (4)
Introduction to research methods in comparative policy analysis and to the design of research proposals. Survey of major competing approaches in the field, with analysis of methods used. Special attention to needs of Ph.D. students formulating dissertation proposals.

IRGN 263. Political Economy of Southeast Asia (4)
This course provides an introduction to five Southeast Asian countries: Indonesia, Thailand, Malaysia, the Philippines, and Vietnam. The focus will be on national level political and economic issues in these countries. In addition, we will also be examining a number of region-wide issues: Chinese business groups and networks; clientelism and corruption; regional trade and investment linkages; democratization; and the implications of political change for future economic development.

IRGN 265. Management of Non-profit Organizations (4)
Analyzes the particular environment in which non-profit organizations define and achieve their objectives. Management tools are applied to existing non-profits and to student projects.

IRGN 266. Public Finance (4)
Describes principles of taxation and expenditure analysis, public budgeting, and assessment of budget priorities.

IRGN 267. Policymaking and Political Economy in Japan (4)
Examines the policymaking process in Japan, the interaction and role of state and non-state actors in shaping Japan's economy. Analysis and comparison, through case studies of industrial policies (toward high-tech and declining industries), and non-industrial policies and their consequences.

IRGN 268. Political Development and Modern China (4)
Political development has dominated the study of comparative politics among U.S. academicians since the revival of the Cold War in 1947. This course examines critically the paradigm and its Western philosophical roots in the context of the experience of modern China. Conjoined with Political Science 132C/232C.

IRGN 269. The Japanese Financial System (4)
This course studies the financial system in Japan and analyzes its role in the development of the Japanese economy. Topics will include *keiretsu* and the main bank system, internationalization and deregualtion of finance, the Bank of Japan and monetary policy. *Prerequisites: IRGN 221 and 243.*

IRGN 270. International Business Strategy (4)
This course analyzes corporate strategies and management issues in their international dimensions. Based on numerous case studies, the class examines the strategic opportunities and problems that emerge when companies transfer corporate skills and competence to other countries.

IRGN 271. Japanese Economy (4)
A broad survey of the Japanese economy, together with in-depth examination of some distinctively Japanese phenomena such as savings behavior, financial structure, industrial organization, and labor markets. *Prerequisites: IRGN 221 and 243, or consent of instructor.*

IRGN 272. Japanese Corporate Culture (4)
This course examines Japanese cultural values and social relations in the context of business organizations. The central focus will be on the integration of individuals into their organizations and on the human relations characteristic of their work environments.

IRGN 273. Current Issues in U.S.-Latin American Relations (4)
Issues to be actively debated include the collective defense of democracy, coping with revolutionary change, counternarcotics, anti-corruption, international finance, trade, and U.S.-Mexican and U.S.-Brazilian relations. In each case, students analyze the strengths and weaknesses of current U.S. policy and advocate alternative options. *Prerequisite: IRCO 210 or consent of instructor.*

IRGN 274. Economic Policy in Latin America (4)
This course seeks to enhance the students' understanding of the main policy alternatives open to the largest Latin American countries. Development and stabilization policies are analyzed, emphasizing the current debate between conventional and heterodox policy packages and their impact on decision making. *Prerequisites: IRGN 221 and 243.*

IRGN 276. International Negotiation (4)
This course attempts to reach a broad audience of students who seek in-depth understanding of how states and other international actors attempt to achieve specific objectives through give-and-take of the negotiation process. Cases include Northern Ireland and Middle East peace processes, negotiations leading to Dayton accords, and negotiations over Antiballistic Missile Treaty.

IRGN 277. Latin American Politics (4)
Introductory reading seminar on Latin American politics to acquaint students with leading schools of thought, provide critical perspective on premises and methodology, and identify themes for further inquiry. Themes include authoritarianism, revolution, democratization, regional conflict, and emergence of middle-level powers. *Conjoined with political Science 235A.*

IRGN 279. Doing Business in Latin America (4)
Explores the realities of conducting business in Latin America. The focus will be on discussing a variety of cases, mainly in four countries—Mexico, Brazil, Argentina and Chile—covering strategic, operational, organizational, and cross-cultural issues. Course format will consist of case studies and includes the development and presentation of a business plan.

IRGN 281. Managing Country Risk in the Modern Multinational Corporation (4)
Examines ways to analyze, assess, and reduce country risk.

IRGN 282. East Asian NICS (4)
Forces explaining the success of four economies in East Asia (South Korea, Taiwan, Hong Kong, Singapore), and two natural resource-rich states (Malaysia, Thailand) will be addressed. Theoretical models, implementation of development policies/strategies, and sociopolitical causes and consequences of development will be discussed. *Prerequisites: IRGN 221 and 243, or IRGN 210 and 218, or consent of instructor.*

IRGN 284. Korean Politics (4)
This course will examine characteristics and distinctive aspects of contemporary Korean society and politics. Emphasis will be placed on continuity and change in social values, political culture and leadership, economic growth and its impact, and democratization and its future prospects.

IRGN 285. The Korean Economy (4)
Analytical review of South Korea's economic performance. Examination of major policy changes (e.g., shifts toward export promotion, heavy and chemical industrial promotion); Korea's industrial structure including the role of large enterprise (chaebol); role of government; links between Korea and other countries.

IRGN 286. Business and Policy in Southeast Asia (4)
Surveys various dimensions of business in Southeast Asia, with particular attention to the policy context. Special focus on technological capabilities of business organizations in Southeast Asia. *Prerequisites: IRGN 290: Economics in Southeast Asia, or consent of instructor.*

IRGN 287. Politics and Institutions in Latin America (4)
Overview of Latin American politics and the "rules of the game," both formal and informal. Key topics include military rule, presidentialism, and clientelism in the region as a whole, with special emphasis on Argentina, Brazil, Chile, and Mexico.

IRGN 288. Policy-Making in Latin America (4)
Major policy issues in contemporary Latin America, especially the breakdown of import substitution and subsequent liberalization of economies. Special attention to the coalition strategies of politicians and the capacity of state institutions to deliver public goods. *Prerequisite: IRGN 287 or consent of instructor.*

IRGN 289. Applied Environmental Economics (4)
This course teaches students how to analyze environmental and natural resource policy issues in developing countries using economic concepts and methods. Weekly spreadsheet exercises based on real-world data provide hands-on practice. *Prerequisites: IRCO 453, 454, IRGN 221, or consent of instructor.*

IRGN 290. Special Topics in Pacific International Affairs (4)
A seminar course at an advanced level on a special topic in Pacific international affairs. May be repeated for credit.

IRGN 298. Directed Group Study (2-12)
Directed reading in a selected area. The content of each course is to be decided by the professor directing the course, with the approval of the student's faculty adviser. May be repeated for credit.

IRGN 299. Independent Research (2-12)
Independent research under the guidance of a faculty member at IR/PS. May be repeated for credit.

International Studies

OFFICE: Suite 100, ERC Administration Building
Web site: www.intlstudies.ucsd.edu

Program Faculty

Suzanne A. Brenner, Ph.D., *Associate Professor, Anthropology*
Charles L. Briggs, Ph.D., *Professor, Ethnic Studies*
J. Lawrence Broz, Ph.D., *Associate Professor, Political Science*
Robert Cancel, Ph.D., *Associate Professor, Literature*
Marsha A. Chandler, Ph.D., *Professor, Political Science/Senior Vice Chancellor-Academic Affairs*
William M. Chandler, Ph.D., *Professor, Political Science*
Ellen Comisso, Ph.D., *Professor, Political Science*
Ann L. Craig, Ph.D., *Associate Professor, Political Science; Provost, Eleanor Roosevelt College*
Joseph W. Esherick, Ph.D., *Professor, History*
Clark Gibson, Ph.D., *Associate Professor, Political Science*
Peter Gourevitch, Ph.D., *Professor, International Relations & Pacific Studies*
Stephen Haggard, Ph.D., *Professor, International Relations & Pacific Studies*
Gordon H. Hanson, Ph.D., *Professor, International Relations & Pacific Studies*
Takeo Hoshi, Ph.D., *Professor, International Relations & Pacific Studies*
Christine Hunefeldt-Frode, Ph.D., *Professor, History*
Stephanie Jed, Ph.D., *Associate Professor, Literature*
Bennetta Jules-Rosette, Ph.D., *Professor, Sociology*
Miles Kahler, Ph.D., Professor, *International Relations & Pacific Studies, Director*
Hasan Kayali, Ph.D., *Professor, History*
Todd Kontje, Ph.D., *Professor, Literature*
David A. Lake, Ph.D., *Professor, Political Science*
Lisa M. Lowe, Ph. D., *Professor, Literature*
Victor Magagna, Ph.D., *Associate Professor, Political Science*
Timothy McDaniel, Ph.D., Professor, Sociology

Maria Polinsky, Ph.D., *Professor, Linguistics*
Nancy G. Postero, Ph.D., *Assistant Professor, Anthropology*
Pamela B. Radcliff, Ph.D., *Associate Professor, History*
James E. Rauch, Ph.D., *Professor, Economics*
Joel Robbins, Ph.D., *Associate Professor, Anthropology*
Akos Rona-Tas, Ph.D., *Associate Professor, Sociology*
Lisa R. Shaffer, Ph.D., *Adjunct Professor/Director/ International Relations, International Relations & Pacific Studies/Scripps Institute of Oceanography/DO*
Peter N. Smith, Ph.D., *Professor, Political Science*
Stefan A. Tanaka, Ph.D., *Associate Professor, History*
Christena L. Turner, Ph.D., *Associate Professor, Sociology*
Donald Tuzin, Ph.D., *Professor, Anthropology*
Carlos H. Waisman, Ph.D., *Professor, Sociology*
Lisa Yoneyama, Ph.D., *Associate Professor, Literature*
Leon Zamosc, Ph.D., *Associate Professor, Sociology*

The International Studies Program

Technology and the forces of cultural and economic integration appear to reduce the distances between societies, which now impinge on one another on many dimensions. At the same time, ethnic, religious, and economic conflicts erupt within and between societies, often in violent form. Both the proximity of other societies and the remaining divides within and between them demand a better understanding of their cultures and institutions. Societies cannot be understood in isolation or at a single point in time, however; they are shaped by global and regional environments—political, military, economic, cultural—and their pasts. Individuals and societies in turn shape those environments as they reinterpret their histories.

Using different disciplinary lenses, the international studies major explores the interaction between international and national, global and local, contemporary and historical. The program builds on the strengths of existing international specializations at UCSD. International relations and comparative politics are established and distinguished fields of political science. The comparative study of societies and cultures lies at the core of sociology and anthropology. Literature and linguistics offer a rich array of courses dealing with languages and traditions outside the English-speaking societies. Area studies programs provide comprehensive understanding of particular countries and regions.

The international studies major provides students with both a firm grounding in a discipline and the flexibility to permit exploration from alternative perspectives. The primary and secondary tracks chosen by each student contain the disciplinary foundations of the major. International studies majors also complete two core courses that serve as gateways to disciplinary approaches and to central international and comparative issues that cut across disciplines. Among these subjects are cultural boundaries and identities, economic and social development, international and regional integration and their effects, the evolution of political and social institutions, and forms of communication and language. A required capstone seminar permits the completion of a research paper in close association with a member of the faculty. International studies majors benefit throughout from the activities and programs of the Institute for International, Comparative, and Area Studies (IICAS), the home for international studies at UCSD.

Education Abroad

Majors in international studies are encouraged to participate in the UC Education Abroad Program (EAP) and UCSD's Opportunities Abroad Program (OAP). Subject to approval by the faculty director of the major, courses taken through EAP/OAP will be accepted for credit toward the major. Students are strongly encouraged to complete INTL 101 and INTL 102 before departure. Students interested in studying abroad should see an international studies program adviser to discuss appropriate courses and programs for their plan of study. Information on EAP/OAP is given in the Education Abroad Program section of the UCSD General Catalog. Interested students should contact the Programs Abroad Office in the International Center and visit its Web site at http://www.ucsd.edu/icenter/pao. Financial aid can be used for EAP/OAP study, and special study abroad scholarships are also available.

CAREERS

International studies attracts students who are interested in a variety of careers, including government and international organizations, international business, non-governmental organizations, journalism, the arts, and the media. Because of its strong disciplinary core, the major also prepares students who wish to pursue graduate degree programs in international affairs or in one of the participating disciplines.

HONORS

The Honors Program in International Studies recognizes academic excellence in the major. The Honors Program allows qualified students to complete an honors thesis on a topic of their choice in close collaboration with a member of the faculty. Students who wish to participate in the Honors Program in International Studies should indicate their interest in the Spring quarter of their junior year. Honors program application is available on the Web site at http://www.intlstudies.ucsd.edu/requirements.html under HONORS. Application is due by Monday of the ninth week, the quarter before you enroll in 190H.

Requirements for the Honors Program

Candidates for honors in any of the International Studies degrees must meet the following requirements:

- A GPA of 3.5 in courses in the International Studies Major (INTL 101, 102, primary track, and secondary track courses)
- Completion of INTL 190H: Senior Honors Seminar in International Studies.
- Completion of a senior honors thesis (INTL 196H). On the recommendation of the student's instructor in INTL 190H and with the approval of the director of the International Studies program, qualified students will enroll in INTL 196H: Directed Thesis Research (4 units) and complete a senior honors thesis under the direction of a member of the International Studies faculty. The thesis must reflect a research project that is substantially broader in scope and that includes more original research than the research paper required of all International Studies students in INTL 190.

Criteria for "distinction," "high distinction," and "highest distinction"

- Students must maintain a 3.5 GPA in the major to graduate with distinction.
- Each student whose honor thesis also earns a grade of A– shall be entitled to the designation "with distinction."
- Each student whose honors thesis earns a grade of a A shall be entitled to the designation "with high distinction."

- Each student whose honors thesis earns a grade of a A+ shall be entitled to the designation "with highest distinction."

The International Studies Major

A student who satisfactorily completes the general-education requirements of Muir, Revelle, Marshall, Warren, Roosevelt, or Sixth College in addition to the international studies requirements described below will be awarded one of the following bachelor of arts degrees based upon selection of the primary track:

International Studies-Anthropology

International Studies-Economics

International Studies-History

International Studies-Linguistics

International Studies-Literature

International Studies-Political Science

International Studies-Sociology

All upper-division courses applied to the requirements of the major must be taken for a letter grade. A 2.0 grade-point average is required in the major, and students must earn at least C– in each course counted for the major. Transfer students should see the international studies adviser to determine whether courses taken elsewhere satisfy international studies program requirements.

Lower-Division Requirements

Foreign language (four quarters of college-level language or equivalent proficiency)

Students majoring in international studies are required to demonstrate basic proficiency in a modern foreign language by completing four quarters of foreign language instruction (or equivalent) with a passing grade. Students may also complete this requirement by demonstrating advanced language ability on a proficiency exam.

College-level language study is a prerequisite for study abroad in most non-English speaking countries and enhances understanding of those societies. Students who plan to study abroad in non-English speaking countries may need to take additional language classes, and they will need to take all language courses for letter grades.

Students should make substantial progress toward fulfilling college general-education requirements and the foreign language requirement of the international studies major before beginning the core sequence of the international studies major.

Departmental tracks (described below) may have lower-division requirements. In the absence of such requirements, majors are encouraged to take lower-division courses that will prepare them for their departmental or area tracks. Students in colleges whose general-education requirements do not have an international component are also encouraged to take lower-division courses in their prospective departmental or area tracks or as part of their college distribution requirements.

Upper-Division Requirements

The upper-division requirements for a major in international studies are

1) Two core courses (INTL 101 and INTL 102)
2) A capstone seminar (INTL 190)
3) Eight 4-unit upper-division courses in a primary track
4) Five 4-unit upper-division courses in a secondary track

CORE COURSES

Two core courses (INTL 101 and INTL 102) provide an intellectual gateway to central issues and disciplinary approaches in international studies. Students may begin the sequence with either course. Sophomore status is a prerequisite for both courses.

INTL 101. Culture and Society in International Perspective (4)

INTL 102. Economics, Politics, and International Change (4)

CAPSTONE SEMINAR

All majors will complete the capstone seminar, preferably in the fall or winter quarter of the senior year. Students are required to complete a research paper for this course.

INTL 190. Seminar in International Studies (4)

PRIMARY AND SECONDARY TRACKS

Each international studies major will complete eight four-unit upper-division courses for his or her primary track. Five additional four-unit upper-division courses will be required for a secondary track. Of these thirteen track courses (eight primary and five secondary), three courses must concentrate on one country or region.

DEPARTMENTS OFFERING BOTH PRIMARY AND SECONDARY TRACKS

Anthropology:

Primary Track: Students are required to take at least one course from the core sequence, Anthropology: Program Courses (ANPR):

ANPR 105. Social Anthropology

ANPR 106. Cultural Anthropology

ANPR 107. Psychological Anthropology

The remaining upper-division courses should be selected from the Anthropology: General (ANGN) and Anthropology: Regional (ANRG) listings. Up to two approved courses from Anthropology: Biological Anthropology (ANBI) can also be counted toward the major with the approval of the international studies program adviser.

Secondary Track: Students should be encouraged to take ANPR 105 and 106; all other courses should be from the ANPR, ANGN, or ANRG series; one course from the ANBI series will be accepted for credit by petition.

Economics:

Primary and Secondary Tracks: Both primary and secondary track IS majors must satisfy lower-division department requirements:

Calculus. Mathematics 10A-B-C or Mathematics 20A-B and 20C and

Economics 1, 2, 3

Upper-division courses may be selected from:

Economics 100A-B. Microeconomics or Economics 170A-B Management Science Microeconomics

Economics 110A-B. Macroeconomics

Economics 120A-B-C. Econometrics

Economics 101. International Trade

Economics 103. International Monetary Relations

Economics 116. Economic Development

Economics 117. Economic Growth

Economics 125. Economics of Population Growth

Economics 131. Economics of the Environment

Economics 132. Energy Economics

Economics 145. Economics of Ocean Resources

Economics 161. Latin American Economic Development

Economics 163. Japanese Economy

Both primary and secondary track majors must take at least two of the following courses:

Economics 101. International Trade

Economics 103. International Monetary Relations

Economics 116. Economic Development

Economics 117. Economic Growth

Economics 125. Economics of Population Growth

Economics 131. Economics of the Environment

Economics 132. Energy Economics

Economics 145. Economics of Ocean Resources

Economics 161. Latin American Economic Development

Economics 163. Japanese Economy

At least one of the above must be Economics 101, 103, or 116.

History:

Primary Track: At least 6 of 8 courses must be taken in any of the following categories:

History of Africa (HIAF)

History of Europe (HIEU)

History of East Asia (HIEA)

History of the Near East (HINE)

History of Latin America (HILA)

History of Science (HISC)

History of Religion (HIRE) and/or History Topics (HITO), except HITO 194-199

Up to two courses may be taken in History of the United States (HIUS).

Secondary Track: All courses must be taken in non-U.S. history.

Linguistics:

Primary Track: Eight upper-division courses in linguistics, which must include LIGN 101 (Introduction to the Study of Language) and at least three courses from the following list:

LIGN 105. Law and Language

LIGN 108. Languages of Africa

LIGN 141. Language Structures

LIGN 142. Language of Typology

LIGN 143. Structure of Spanish

LIGN 145. Pidgins and Creoles

LIGN 174. Gender and Language in Society

LIGN 175. Sociolinguistics

LIGN 176. Language of Politics and Advertising

LIGN 177. Multilingualism

At most, one of the eight courses can be LIGN 199 (Independent Study in Linguistics).

Secondary Track: Five upper-division courses in linguistics, which must include LIGN 101 (Introduction to the Study of Language) and at least two courses from the list above. At most, one of the five courses can be LIGN 199 (Independent Study in Linguistics).

Literature:

Primary Track: Eight upper-division courses may be selected from the following:

Literatures in English (LTEN):

LTEN 188. Contemporary Caribbean Literature

LTEN 189. Twentieth-Century Postcolonial Literatures

and all courses listed under:

Literatures in Chinese (LTCH)

Literatures in French (LTFR)

Literatures in German (LTGM)

Greek Literature (LTGK)

Literatures in Italian (LTIT)

Latin Literature (LTLA)

Korean Literature (LTKO)

Literatures in Portuguese (LTPR)

Russian Literature (LTRU)

Literatures in Spanish (LTSP) with exception of (150,151,152,153,162)

Selected courses listed as Literatures from the World (LTWL) can also be taken for credit for the IS major with the approval of the undergraduate adviser.

Students whose primary track is in Literature may take up to two courses in Literature/Theory (LTTH) and Literature/Cultural Studies (LTCS) with approval of the undergraduate advisor.

Secondary Track: Five courses selected from the above.

Political Science:

Primary Track: Eight courses selected from the following: all courses numbered POLI 120 through POLI 159:

Comparative Politics: POLI 120A through POLI 139A

International Relations: POLI 140A through POLI 159

Up to three courses may be from the following subfields:

American Politics: POLI 100A through POLI 108

Political Theory: POLI 110A through 119A

Policy Analysis: POLI 160AA through 168

Research Methods: POLI 170A and POLI 181

Secondary Track: Five upper-division courses selected from courses numbered POLI 120 through POLI 159 (see above); 1 of the 5 courses may be selected from the following subfields:

American Politics: POLI 100A through POLI 108

Political Theory: POLI 110A through 119A

Policy Analysis: POLI 160AA through 168

Research Methods: POLI 170A and POLI 181

Sociology:

Primary Track: Eight upper-division courses selected from the following list:

Cluster B: Culture, Language, and Social Interaction (Soc/B)

Soc/B 111A-B. Human Rights

Soc/B 122. Jerusalem: Sacred and Profane

Soc/B 162R. Religion and Popular Culture in East Asia

Cluster C: Social Organization and Institutions (Soc/C)

Soc/C 136A. Sociology of Mental Illness: An Historical Approach

Soc/C 136B. Sociology of Mental Illness in Contemporary Society

Soc/C 139. Social Inequality: Class, Race, and Gender

Soc/C 148. Political Sociology

Soc/C 156. Sociology of Religion

Soc/C 157. Religion in Contemporary Society

Soc/C 180. Social Movements and Social Protest

Cluster D: Comparative and Historical Sociology (Soc/D)

Soc/D 151. Comparative Race and Ethnic Relations

Soc/D 158J. Religion and Ethics in China and Japan

Soc/D 169. Citizenship, Community, and Culture

Soc/D 171. Science and the Making of the Modern World

Soc/D 177. International Terrorism

Soc/D 178. The Holocaust

Soc/D 179. Social Change

Soc/D 181. Modern Western Society

Soc/D 183. Minorities and Nations

Soc/D 185. Sociology of Development

Soc/D 187. African Societies through Films

Soc/D 188A. Community and Social Change in Africa

Soc/D 188B. Chinese Society

Soc/D 188D. Latin America: Society and Politics

Soc/D 188F. Modern Jewish Societies and Israeli Society

Soc/D 188J. Change in Modern South Africa

Soc/D 189. Special Topics in Comparative-Historical Sociology

Secondary Track: Five upper-division courses selected from the above lists.

DEPARTMENTS AND PROGRAMS OFFERING ONLY SECONDARY TRACKS

Communication:

Course Prerequisites: Must have taken COGN 20 to enroll in upper-division courses.

Secondary Track: Five courses selected from the following lists:

Communication as a Social Force (COSF)

COSF 120. The Transformation of Global Communication

COSF 140A. Comparative Media Systems: Asia

COSF 140B. Comparative Media Systems: Europe

COSF 140C. Comparative Media Systems: Latin America and the Caribbean

COSF 159. Work and Industry in the New Information Economy

COSF 160. Political Economy/ Global Consumer Culture

COSF 167. Emerging Global High-Tech Regions: Labor and National Development

COSF 181. Political Economy of International Communications

Communication and Culture (COCU)

COCU 110. Cinema in Latin America

COCU 130. Tourism: Global Industry and Cultural Form

COCU 162. Popular Culture

COCU 179. Colonialism and Culture

COCU 180. Cultures and Markets

Communication and Human Information Processing (COHI)

COHI 114. Bilingual Communication
COHI 121. Literacy, Social Organization, and the Individual

Regional Secondary Tracks

Five upper-division courses in a single area studies program selected from the following list of programs:

African Studies
Chinese Studies
German Studies
Italian Studies
Japanese Studies
Latin American Studies
Middle East Studies
Russian and Soviet Studies
Third World Studies

Course lists can be found in the *UCSD General Catalog.* All courses must be four units, upper-division, non-language courses. Please contact ISP academic adviser with questions.

Students seeking a broader regional focus (e.g., European or East Asian Studies) may elect to combine courses from area studies programs dealing with that region.

COURSES

UPPER-DIVISION

INTL 101. Culture and Society in International Perspective (4)
Analysis of the cultural and social developments of the modern era from the perspective of interaction among societies. Particular attention is paid to the definition, representation, and negotiation of social and cultural boundaries over time. *Prerequisites: department stamp.*

INTL 102. Economics, Politics, and International Change (4)
Examination of the domestic and international sources of economic and political change. Topics include the rise of the nation-state, comparative economic development, authoritarian and democratic regimes, international and civil conflict, globalization and its domestic and international implications. *Prerequisites: department stamp.*

INTL 190. Seminar in International Studies (4)
Required seminar for international studies seniors. Readings and discussion of topics in international and comparative studies from an interdisciplinary perspective. Emphasis on independent work and completion of a research paper. *Prerequisites: successful completion of INTL 101 and 102, senior standing, and department stamp.*

INTL 190H. Honors Seminar in International Studies (4)
Required of all honors students in International Studies. Reading and discussion of topics international and cooperative studies from an interdisciplinary perspective. Emphasis on research design and completion of research paper in preparation for INTL 196H. *Prerequisites: International Studies major with 3.5 major GPA; department stamp; senior standing; INTL 101; INTL 102; consent of instructor.*

INTL 196H. International Studies Honors Program (4)
Open only to seniors who have completed INTL 190H. Completion of an honors thesis under the supervision of a member of the International Studies faculty. *Prerequisites: International Studies major with 3.5 GPA; department stamp; senior standing; INTL 190H; consent of instructor.*

Italian Studies

OFFICE: 3024 Humanities and Social Sciences Building, Muir College (CAESAR Office)
Web site: http://orpheus.ucsd.edu/history/ItalianStud.html

Professor

Carol Plantamura, M.F.A., *Music*
Janet Smarr, Ph.D., *Theatre*
Robert Westman, Ph.D., *History*

Associate Professors

Jack Greenstein, Ph.D., *Visual Arts*
John Marino, Ph.D., *History*
Stephanie Jed, Ph.D., *Literature*
Pamela Radcliff, Ph.D., *History*
Pasquale Verdicchio, Ph.D., *Literature*

Assistant Professor

Nancy Caciola, Ph.D., *History*

Lecturer

Adriana de Marchi Gherini, Ph.D., *Literature*

Italian studies is an interdisciplinary program in the language, literature, history, theater, music, and art of Italy. Italian studies coordinates the resources of the Departments of History, Literature, Music, Theatre and Dance, and Visual Arts, and offers students the opportunity to design a major, leading to a B.A., around the course offerings of these five departments. Students in Italian studies are encouraged to participate in the University of California Education Abroad Program (EAP), which is affiliated with the Universities of Padua, Trento, and Bologna: this provides the possibility of a junior year abroad, including both language courses and courses dealing with various aspects of Italian studies. EAP credits may be transferred back to UCSD to coordinate with on-campus offerings.

The Major Program

A major in Italian studies consists of a choice of twelve upper-division courses in literature, history, music, theatre, and visual arts approved for the program and listed below. Courses in other areas of Italian studies taken abroad or on our campus may also apply. At least three areas must be represented in the student's program of study. The particular courses making up each student's major will be selected in consultation with the program adviser. The study of Dante (LTIT 115) is considered central for all Italian studies majors.

The Minor Program

A minor in Italian studies consists of seven upper-division courses from among those listed below (at least three areas must be represented). Credit from the EAP program may be applied toward the minor.

Upper-Division/Italian Studies Courses

For description of courses listed below, see appropriate departmental listing.

Literature

LTIT 1A-B-C. The Language of Italian Culture
LTIT 100. Introduction to Italian Literature
LTIT 110. Selected Topics in Italian Literature
(may be repeated for credit as topics vary)
LTIT 115. Medieval Studies
LTIT 116. Sixteenth-Century Prose
LTIT 118. Italian Romanticism
LTIT 122. Studies in Modern Italian Culture
LTIT 136. Studies in Modern Italian Poetry
LTIT 137. Studies in Modern Italian Prose

LTIT 138. Contemporary Italian Thought
LTIT 140. Women in Italy
LTIT 143. Major Italian Authors
LTIT 150. Italian North American Culture
LTIT 161. Advanced Stylistics and Conversation
LTIT 190. Seminar
LTIT 196. Honors Thesis
LTIT 198. Directed Group Study
LTIT 199. Special Studies

N.B.: Students must complete the following prerequisites for all upper-division work in Italian literature:

1. Linguistics/Italian 1A-B-C, or LTIT 1A-B-C
2. Literature/Italian 2A-B, 50

Visual Arts

122BN. Italian Art of the Early Renaissance
122CN. High Renaissance Art
122D. Michelangelo
122E. The City in Italy
128BN. Topics in Early Modern Art History (when on Italian topic)
129BN. Special Problems in Early Modern Art History (when on Italian topic)

History (HIEU)

113. Rule, Conflict, and Dissent
122. Politics, Italian Renaissance Style
124. The City in Italy
199. Independent Study for Undergraduates

The following courses may be applied to the major or minor, when 50 percent or more of the course focus is on Italian topics:

Music 113
THHS 101

Additional courses counting toward a major in Italian studies are offered on a year-to-year basis. As these often cannot be listed in the catalog in advance, interested students should consult the program faculty for an up-to-date list.

Japanese Studies

OFFICE: 3024 Humanities and Social Sciences Building, Muir College
Web site: http://japan.ucsd.edu

Faculty

Yumiko Blanford, *Lecturer, History (Japanese Language)*
Takashi Fujitani, *Associate Professor, History*
Takeo Hoshi, *Professor, International Relations and Pacific Studies*
Germain A. Hoston, *Professor, Political Science*
Hifumi Ito, *Lecturer, History (Japanese Language)*
Noriko Kameda, *Lecturer, History (Japanese Language)*
Yukata Kunitake, *Lecturer, History (Japanese Language)*
Ellis Krauss, *Professor, International Relations and Pacific Studies*
Sige-Yuki Kuroda, *Professor Emeritus, Linguistics*
Mayumi McKee, *Lecturer, History (Japanese Language)*
Masao Miyoshi, *Hajime Mori Professor of Japanese, English, and Comparative Literature*
Masato Nishimura, *Lecturer, History (Japanese Language)*
Ulrike Schaede, *Associate Professor, International Relations and Pacific Studies*
Stefan Tanaka, *Associate Professor, History*
Yasu-Hiko Tohsaku, *Professor, International Relations and Pacific Studies*
Christena Turner, *Associate Professor, Sociology*
Lisa Yoneyama, *Associate Professor, Literature*
Joji Yuasa, *Professor Emeritus, Music*

The Program in Japanese Studies coordinates a variety of campus offerings dealing with the language, history, culture, and political economy of Japan. The program is especially strong in the area of modern and contemporary Japan. In addition to courses available in the Departments of Anthropology, Economics, History, Linguistics, Literature, Music, Political Science and Sociology, qualified undergraduates also may enroll in Japan-related courses in the Graduate School of International Relations and Pacific Studies with consent of instructors.

The Major

A. LOWER-DIVISION REQUIREMENT (9 COURSES)

1. Japanese language: two years lower-division or the transferred equivalent:
   Japanese Studies 10A-B-C
   Japanese Studies 20A-B-C
2. The remaining three courses may be chosen from among the following:
   a. East Asian History: HILD 10-11-12
   b. Eleanor Roosevelt College students may petition to use MMW Courses 2 and 5.
   c. Thurgood Marshall College students may petition to use DOC course 1.
3. The language requirement may be waived by demonstrating the equivalent proficiency through exam.

B. UPPER-DIVISION REQUIREMENT (12 COURSES)

1. Japanese language: six upper-division language courses or the transferred equivalent from:
   Japanese Studies 100A-B-C
   Japanese Studies 130A-B-C
   Japanese Studies 140A-B-C
   Japanese Studies 150A-B-C
2. Japanese Studies 190 (JAPN 190): Selected Topics in Contemporary Japanese Studies. This is a seminar-style course focusing on selected topics in contemporary interdisciplinary studies of Japan. This course will be offered once a year.
3. The remaining five courses must be taken from two or more different disciplines.
   a. Students may petition to include two non-language upper-division courses taken abroad under EAP or OAP.
   b. Students may include one 199.
   c. Students may include one course on China or Korea.
4. All upper-division courses must be taken for a letter grade.
5. The language requirement can be waived by demonstrating the equivalent proficiency through exam. The required number of courses must be fulfilled by taking other non-language upper-division courses.

C. HONORS PROGRAM

1. Junior standing.
2. A GPA of 3.5 or better in the major.
3. Overall GPA of 3.2 or better.
4. Completion of at least four upper-division non-language courses approved by the Program in Japanese Studies.
5. Recommendation of a faculty sponsor familiar with the student's work.

Students who qualify for honors take a two-quarter sequence Japanese Studies 196A-B (fall and winter quarters preferred) of directed study

during which they define a research project, carry out the research, and complete an honors thesis.

The completed honors thesis will be evaluated by a committee consisting of the student's thesis adviser and one other faculty member appointed by the Program in Japanese Studies director.

The Minor

A minor in Japanese studies consists of at least fifteen units of Japanese language (lower- or upper-division) and at least sixteen units of upper-division non-language coursework taken from two or more departments. Students may use one non-language course taken abroad. All courses to be used for the minor must be approved by the Program in Japanese Studies and must be taken for a letter grade. Students who are already beyond first- and second-year language levels will be placed in one of our upper-division Japanese language courses, Written Japanese (100A-B-C), Third-Year Japanese (130A-B-C), Fourth-Year Japanese (140A-B-C), or Advanced Japanese (150A-B-C), and will be required to take four upper-division language courses and three upper-division non-language courses. The language requirement can be waived by demonstrating the equivalent proficiency through exam. The required number of courses must be fulfilled by taking other non-language, upper-division courses.

COURSES

All graduate-level courses require permission of the instructor for undergraduate students. Course titles may vary from year to year.

HISTORY

HIEA 111. Japan: Twelfth through Mid-Nineteenth Century

HIEA 112. Japan: from Mid-Nineteenth Century through U.S. Ocupation

HIEA 113. The Fifteen-Year War in Asia and the Pacific

HIEA 114. Postwar Japan

HIEA 115. Social and Cultural History of Twentieth-Century Japan

HIEA 116. Japan-U.S. Relations

HIEA 160. Colloquium on Modern Japanese History

HIEA 161. Representing Japan

JAPANESE STUDIES

JAPN 190. Selected Topics in Contemporary Japanese Studies

LANGUAGE

(Students who have prior preparation of Japanese language are placed in language courses based on the results of a placement exam or an oral interview with an instructor. Students who have lived in Japan, or use Japanese at home are required to take a placement exam administered prior to the beginning of the fall quarter. Contact the Japanese Studies office for more information.)

10A-B-C. First-Year Japanese
(No prior study of Japanese language is required for 10A.) *Prerequisites for 'B' and 'C': previous course or consent of instructor.*

20A-B-C. Second-Year Japanese
Prerequisites: previous course or consent of instructor.

100A-B-C. Japanese for Bilingual Speakers I
(These courses are for those students who have a high level of speaking proficiency in Japanese but no or little reading and writing abilities.) *Prerequisite for 'A': consent of instructor. Prerequisites for 'B' and 'C': previous course or consent of instructor.*

130A-B-C. Third-Year Japanese
Prerequisites: previous course or consent of instructor.

140A-B-C. Fourth-Year Japanese
Prerequisites: previous course or consent of instructor.

150A-B-C. Advanced Japanese
Prerequisites: previous course or consent of instructor.

ECONOMICS

ECON 163. Japanese Economy

LITERATURE

LTEA 130. Earlier Japanese Literature in Translation
(Quarter offerings will vary among A. General Literature; B. Poetry; C. Prose Fiction; D. Drama; and E. Essays, travelogues, diaries, etc.)

LTEA 132. Later Japanese Literature in Translation
(Quarter offerings will vary among A. General Literature; B. Poetry; C. Prose Fiction; D. Drama and Film; and E. Essays, criticism, etc.)

LTEA 134. A Single Japanese Author (in translation)

LTEA 136. Special Topics in Japanese Literature

LTWL 155. Gender Studies

LTCS 120. Historical Perspectives on Culture

LTCS 130. Gender, Race, Ethnicity/Class, and Culture

LTCS 150. Topics in Cultural Studies

Lit/Th 240. Forms and Genres (when on Japan)

MUSIC

(Check with program office as to whether these courses may be used toward a Japanese studies minor.)

111. World Music

211. Seminar in World Music

POLITICAL SCIENCE

132B. Modernity and Identity in East Asia

133A. Introduction to Japanese Politics

133B. Chinese and Japanese Political Thought (I)

133C. Chinese and Japanese Political Thought (II)

133D. Japanese Foreign Policy

133E. Public Policy in Japan

233. Politics and Political Economy in Contemporary Japan

SOCIOLOGY

SOC/D 158J. Religion and Ethics in China and Japan

SOC/B 162R. Religion and Popular Culture in East Asia

GRADUATE SCHOOL OF INTERNATIONAL RELATIONS AND PACIFIC STUDIES

IRGN 400. International Relations of Asia—Pacific

IRGN 416. Postwar Politics in Japan

IRGN 471/271. Japanese Economy

Judaic Studies

OFFICE: 4008 Humanities and Social Sciences Building, Muir College
http://historyweb.ucsd.edu//JudaicStud.html

Faculty

David Noel Freedman, Ph.D., *Professor, History; Endowed Chair, Hebrew Biblical Studies*
Richard Elliott Friedman, Th.D., *Professor, Hebrew and Comparative Literature; Katzin Chair in Jewish Civilization*
David M. Goodblatt, Ph.D., *Professor, History; Endowed Chair in Judaic Studies*
Deborah Hertz, Ph.D., *Professor, History; Herman Wouk Chair in Modern Jewish Studies*
Thomas E. Levy, Ph.D., *Professor, Anthropology; Director, Judaic Studies*
William H.C. Propp, Ph.D., *Professor, History*

Other Faculty Offering Courses in Judaic Studies

Robert McC. Adams, *Adjunct Professor, Anthropology*
Guillermo Algaze, *Professor, Anthropology*
Steven Cassedy, Ph.D., *Professor, Literature*
Adriana De Marchi Gherini, Ph.D., *Lecturer, Literature*

Arthur Droge, Ph.D., *Professor, Literature*
Sanford Lakoff, Ph.D., *Professor Emeritus, Political Science*
Lisa Lampert, Ph.D., *Assistant Professor, Literature*
Shawna Overton, *Faculty Fellow, History*
Jonathan Saville, Ph.D., *Associate Professor Emeritus, Theatre and Dance*
Gershon Shafir, Ph.D., *Professor, Sociology*
Melford E. Spiro, Ph.D., *Professor Emeritus, Anthropology*
Alana Shuster, *Lecturer, Hebrew*
Randy L. Sturman, *Lecturer, Anthropology*

Judaic Studies is an interdisciplinary program offering courses, majors, minors, concentrations, and masters degrees that draw upon a variety of perspectives. For doctoral programs see below—the Ph.D. in ancient history and the Ph.D. in anthropology. Courses are offered in the Departments of Anthropology, Communication, History, Literature, Music, Political Science, Philosophy, and Sociology.

Students also have the option within the Literatures of the World major, in the Department of Literature, of concentrating on Judaic literature; or on a combined program of the Literatures of the World major (concentration in Judaic literature) and classical studies.

In addition, Revelle and Muir Colleges have noncontiguous minors in Judaic studies and in Hebrew language and literature; Warren College has Judaic studies and Hebrew literature concentrations; and various general requirements in all colleges can be met by courses in the Judaic area. For details students should inquire at their provost's office or at the Judaic Studies Program office.

The Judaic Studies Program offers scholarships and fellowships for study abroad.

Students are encouraged to participate in the UC Education Abroad Program (EAP) in Jerusalem or Beersheva, and to investigate other options through the Opportunities Abroad Program (OAP). By petition, credits earned through EAP/OAP can fulfill UCSD degree, major, and minor requirements. Interested students should contact the Programs Abroad Office in the International Center for more information. Please visit the Web site at http://orpheus.ucsd.edu/icenter/pao.

In addition, the Judaic Studies Program and UCSD Department of Anthropology offer credit and hands-on experience in Near Eastern archaeology at their archaeological field school in Israel or Jordan. Up to twelve units of academic credit may be earned through the UCSD Summer Session Program. Some scholarships are available through Judaic Studies. For more information call the UCSD Summer Session Office. Or visit our Web site at: http://weber.ucsd.edu/Depts/Anthro/classes/tlevy for our archaeological field schools in Israel and Jordan. For a general overview of the Judaic Studies Program see: http://historyweb.ucsd.edu//JudaicStud.html.

Major

Requirements for the major in Judaic studies are:

1. Judaic Studies 100 or equivalent; HITO 104, HITO 105.
2. Twelve upper-division courses in Judaic studies, to be selected in consultation with a faculty adviser.
3. Upper-division competence in Hebrew, normally to be fulfilled by completion of first- and second-year Hebrew language courses, or equivalent.

Minors

A. Requirements for the minor in Judaic studies:
   1. Judaic Studies 100, HITO 104, HITO 105.
   2. Four upper-division courses in Judaic studies, to be selected in consultation with a faculty adviser.

B. Requirements for the minor in Hebrew language and literature:

   Seven quarter courses in Hebrew language and literature, ordinarily Judaic Studies 1, 2, 3, 101, 102, and 103 plus one elective course.

Note: Other course combinations for the major and minor may be approved by the student's faculty adviser.

Note: A majority of the courses for the major or minor must be taken at UCSD.

THE PH.D. IN ANCIENT HISTORY

The Department of History offers a Ph.D. program in ancient history. Relevant major fields are the history of Israel in the biblical period and the history of the Jewish people in antiquity. One of the two minor fields may be outside the history department. Stu-dents must acquire competence in the relevant ancient and modern languages.

THE PH.D. IN ANTHROPOLOGY (ARCHAEOLOGY)

The Department of Anthropology offers graduate training in social, cultural, and psychological anthropology, as well as in anthropological archaeology and biological anthropology. In conjunction with the Judaic Studies Program, students may concentrate in Near Eastern archaeology with a focus on Israel and Jordan. Students pursuing anthropological archaeology are expected to take required courses in anthropology and engage in field research.

THE M.A. IN JUDAIC STUDIES

The M.A. in Judaic Studies, offered under the auspices of the Department of History, is an interdisciplinary program permitting the student to select courses primarily in history and literature, but also in anthropology, political science, sociology, and philosophy.

FELLOWSHIPS

Substantial fellowships are available for Ph.D. students. These include:

The Dita Gumpel Judaic Studies Endowed Fellowship

The University Fellowship

The Wexler Family Judaic Studies Fellowship Fund in honor of David Noel Freedman

Judaic Studies Fellowships

Teaching assistantships are available in the Revelle College Humanities/Writing Program and in other writing programs. Dissertation fellowships may be awarded to doctoral students at the dissertation stage of their studies. Funds are also available for support of travel to archaeological excavations. Students are also eligible for research-travel funds to other campus libraries of the University of California, as well as for grants that permit research in archives and libraries elsewhere. Students who read papers at scholarly conferences may also receive financial support for their participation.

Archaeology

Since 1993, the Judaic Studies Program has sponsored major archaeological excavations in Israel's northern Negev desert. Shortly after the peace treaty was formalized between Israel and

Jordan, the program began a long-term archaeological field program in the Jabal Hamrat Fidan Region (JHF) of southern Jordan. The project aims at studying the influence of early ore procurement and metallurgy on social change from the Neolithic period through the Iron Age. UCSD graduate students play an active role in the fieldwork and laboratory studies of material from these excavations. Qualified students are encouraged to use these data as part of their doctoral studies. In 2004-2005, the UCSD Judaic Studies Program will join in several emergency excavations along the Wadi Fidan in southern Jordan. This is part of the UCSD Summer Session Middle East Field School.

The Judaic Studies Program supports a state-of-the art archaeological laboratory in the Social Sciences Building. A wide range of digital-based technologies is used for archaeological data and image processing that are linked through the Internet. Labs for processing pottery, stone tools, and other materials are available for student use.

Publications

The program produces a series of volumes: *Biblical and Judaic Studies* from the University of California, San Diego (published by Eisenbrauns). *The Anchor Bible* (Commentary, Reference Library, and Dictionary) is edited by David Noel Freedman at UCSD. The program has published four volumes that were developed from international conferences held at UCSD.

Lectures and Conferences

The program regularly hosts international conferences and an annual series of lectures and seminars by distinguished scholars in Hebrew Bible, Archaeology, and Judaica. The Yigal Shiloh Memorial Lecture in Archaeology is given by an archaeologist each year in memory of Professor Yigal Shiloh.

Application Procedures

The deadline for applications is January 9. For further information contact:

University of California, San Diego
GRADUATE PROGRAM, JUDAIC STUDIES 0104
9500 Gilman Drive
La Jolla, California 92093-0104
email: jdempsey@ucsd.edu

COURSES

Following are course offerings in this area.

For descriptions of the courses listed below, refer to the appropriate department's section of the catalog.

Judaic Studies 1. Beginning Hebrew (4)
Acquisition of basic vocabulary, fundamentals of Hebrew grammar, conversation, and reading.

Judaic Studies 2. Intermediate Hebrew (4)
Continued study of vocabulary and grammar, emphasis on fluency in conversation, and reading.

Judaic Studies 3. Intermediate Hebrew, Continued (4)
Vocabulary, grammar, conversation, introduction to literary and nonliterary texts.

Judaic Studies 100. Introduction to Hebrew Bible (4)
An introduction to the Hebrew Bible focusing on the first five books, the Torah.

Judaic Studies 101. Introduction to Hebrew Texts (4)
Reading and analysis of texts from Biblical through modern authors, study of advanced vocabulary and grammar. Course taught in Hebrew and in English.

Judaic Studies 102. Intermediate Hebrew Texts (4)
Further reading and analysis of Hebrew literature from a range of periods. Advanced grammar and vocabulary. Course taught in Hebrew and in English.

Judaic Studies 103. Advanced Hebrew Texts (4)
Synthesis of fluency, reading, and grammatical skills. Reading of texts from a range of periods.

Judaic Studies 110. Introduction to Judaism (4)
An introductory survey of Jewish history, literature, and culture from antiquity to contemporary times. Topics include sacred texts, the variety of groups and views of Judaism, the historical and geographical movements of the Jewish people, and the intersection of religion, ethnicity, and culture.

Judaic Studies 111. Topics in Judaic Studies (4)
Study of a particular period, theme, or literature in Jewish civilization.

Judaic Studies 120. Topics in Zionism: Israelis and Palestinians: Two Cultures in Conflict (4)
This course examines Israeli culture, Palestinian culture, and the conflict between them. We will discuss what is distinct about each culture, how they are different, how they are similar, their histories, and what influences the relationship/conflict between them. *Prerequisites: upper-division standing or consent of instructor.*

Judaic Studies 198. Directed Group Study in Judaic Studies (1-4)
Directed group study on a topic not generally included in the regular curriculum. Student must make arrangements with individual faculty members. (P/NP only)

Judaic Studies 199. Independent Study in Judaic Studies (1-4)
Independent study on a topic not generally included in the regular curriculum. Student must make arrangements with individual faculty members. (P/NP only)

ANLD 3. World Prehistory (4)

ANGN 100. Special Topics in Socio-Cultural Anthropology: Law, Religion, and Politics in Israel (4)

ANGN 142. Pastoralism in Archaeological Ethnographic Perspective (4)

ANGN 181. Anthropological Archaeology (4)

ANGN 183. Chiefdoms, States, and the Emergence of Civilizations (4)

ANPR 194. Archaeological Field School (4)

ANRG 116. Archaeology of Society in Syro-Palestine (4)

ANRG 150. The Rise and Fall of Ancient Israel (4)

ANRG 162. Peoples of the Middle East (4)

ANRG 286. Archaeology, Anthropology, and the Bible—Foundations, Data, and Debate

HIGR 260A-B-C. Seminar in the Judaic Studies (4-4-4)

HIGR 264. Topics in Pre-Islamic Jewish History (4)

HIGR 295. Thesis Seminar

HIGR 296. M.A. Thesis Direction

HIGR 298. Directed Reading (1-12)

HIGR 299. Ph.D. Thesis Direction (1-12)

HIGR 500. Apprentice Teaching (1-40)

HINE 100. The Ancient Near East and Israel (4)

HINE 102. The Jews in Their Homeland in Antiquity (4)

HINE 103. The Jewish Diaspora in Antiquity (4)

HINE 104. The Bible and the Ancient Near East: The Primary History (4)

HINE 105. The Bible and the Near East: The Prophets (4)

HINE 106. The Bible and the Near East: The Writings (4)

HINE 108. The Middle East before Islam (4)

HINE 109. Learning to Read Biblical Hebrew (4)

HINE 114. History of the Islamic Middle East (4)

HINE 116. The Middle East in the Age of European Empires (1798 to 1914) (4)

HINE 118. The Middle East in the Twentieth Century (4)

HINE 151A/251A. Introduction to Aramaic Language (4)

HINE 151B/251B. Introduction to Aramaic Dialects (4)
Prerequisite: previous course.

HINE 151C/251C. Introduction to Aramaic Dialects (4)
Prerequisite: previous course.

HINE 152A/252A. The Evolution of the Northwest Semitic Dialects (4)
Prerequisites: knowledge of at least one Semitic language; a course in general linguistics also desirable.

HINE 152B/252B. Introduction to Ugaritic (4)
Prerequisite: previous course.

HINE 152C/252C. Advanced Ugaritic (4)
Prerequisite: previous course.

HINE 153A/253A. Introduction to Akkadian Language and Mesopotamian Culture (4)

HINE 153B/253B. Continued Akkadian Language (4)
Prerequisite: previous course.

HINE 153C/253C. Advanced Akkadian Language (4)
Prerequisite: previous course.

HINE 160/260. Special Topics in the Bible and Ancient Near East (4)

HINE 161/261. Seminar in the Hebrew Bible (4)

HINE 166/266. Nationalism in the Middle East (4)

HINE 170/270. Special Topics in Jewish History (4)

HINE 181/281. Problems in Hebrew Manuscripts (4)

HINE 186/286. Topics in Middle Eastern History (4)

HINE 199. Independent Study in Near Eastern History (4)

HITO 104. The Jews and Judaism in the Ancient and Medieval Worlds (4)

HITO 105. The Jews and Judaism in the Modern World (4)

HITO 106. How Jewish Women Lived in Modern Times (4)

Humanities 1. The Foundations of Western Civilization: Israel and Greece (6)

LTCO 212. Studies in the Hebrew Bible (4)

LTEU 105. Medieval Studies: Crusade, Conquest, Conversion in Medieval Literature (4)

LTNE 101. Bible: The Narrative Books (4)

LTNE 102. Bible: The Prophetic Books (4)

LTNE 103. Bible: The Poetic Books (4)

LTWL 115. Contemporary Literature/Italy and Holocaust: Jewish Experience in Literature (4)

LTWL 134. A Cultural History of American Jewry (4)

LTWL 138. Critical Religion Studies (4)

LTWL 148. Yiddish Literature in Translation (4)

LTWL 198. Directed Group Study (4)

LTWL 199. Special Studies (4)

Courses cross-listed as LTNE and LTWL may be taken as Hebrew literature by students proficient in the language or as general literature by students without knowledge of Hebrew.

Music II. Folk Music: Klezmer Music (4)

Philosophy 185. Philosophy of Religion (4-4)

Political Science 121. Government and Politics of the Middle East (4)

Political Science 121B. Politics in Israel (4)

Political Science 138D. The Arab-Israeli Conflict (4)

Sociology/C 156. Sociology of Religion (4)

Sociology/C 157. Religion in Contemporary Society (4)

Sociology/D 178. The Holocaust (4)

Sociology/D 188F. Modern Jewish Societies and Israeli Society (4)

Language

See particular languages under linguistics (beginning and intermediate) or literature (advanced).

Language and Communicative Disorders

OFFICE: Cognitive Science Building, Room 266
Mail code: 0526
(619) 594-6775
http://crl.ucsd.edu
http://chhs.sdsu.edu/SLHS/phdmain.php

Professors

Farrell Ackerman, Ph.D., *Linguistics*
Ursula Bellugi, Ed.D., *Adjunct/Psychology*
Jeff Elman, Ph.D., *Cognitive Science*
Mark Kritchevsky, M.D., *Clinical Neurosciences*
Marta Kutas, Ph.D., *Cognitive Science*
Carol Padden, Ph.D., *Communication*
David Swinney, Ph.D., *Psychology*
Doris Trauner, M.D., *Neurosciences/Pediatrics*

Associate Professors

Karen Emmorey, Ph.D., *Adjunct/Psychology*
Victor Ferreira, Ph.D., *Psychology*
John Moore, Ph.D., *Linguistics*

Assistant Professors

Leslie Carver, Ph.D., *Psychology*
Gedeon Deak, Ph.D., *Cognitive Science*

Research Scientist

Nina Dronkers, Ph.D. *(Adjunct/Neurology UC Davis)*

The Joint Doctoral Program

San Diego State University (SDSU) and the University of California, San Diego (UCSD), offer jointly a doctoral program in Language and Communicative Disorders. The program's focus is the interdisciplinary study of language and communicative disorders. A major emphasis of the program is to apply techniques developed in cognitive science and neuroscience to the study of language and language disorders. The program involves study and research in normal language (including sign languages of the deaf and language impairments), and in the neural bases of language use and language loss. Participating faculty have research interests in a wide range of issues in processes of language development, language and aging, multilingualism, language disorders, assessment, and intervention. Graduates of the program will be qualified to serve as faculty in university programs in a variety of disciplines, and to provide leadership in research and health services. The doctoral program faculty at UCSD are an interdisciplinary group from the Departments of Cognitive Science, Communication, Linguistics, Neurosciences, and Psychology. The doctoral program faculty at SDSU are members of the Departments of Communicative Disorders, Linguistics, and Psychology. The program is coordinated by the doctoral program coordinators at each campus, in conjunction with an Executive Committee comprising three faculty from each campus appointed by the Graduate Deans from each campus.

The program is innovative in that many of the requirements are designed to function as a model of professional preparation specifically incorporating activities in which a successful teacher and researcher must engage after obtaining the Ph.D: students will be required to participate in interdisciplinary research throughout the program, learn about the nature and ethics of research, prepare grant proposals, write manuscripts, and will gain experience in oral presentations and teaching. Graduates from the program will be well prepared for the rigors of an academic/research career. The doctoral program in Language and Communicative Disorders, being interdisciplinary, draws from a variety of undergraduate disciplines including communicative disorders, psychology, cognitive science, linguistics, engineering, and other related sciences. Students should have adequate preparation in mathematics, statistics, and biological sciences. Background in neurosciences and/or language sciences, or language disorders is helpful, but not required for admission.

By the end of the first year, all students will select a major field of emphasis by choosing one of three concentrations. The *Adult Language* concentration is intended to provide intensive education in communicative disorders in adults. Students in this concentration will also develop expertise in the study of language processing in normal adults. The *Child Language* concentration is intended to provide specialized education in childhood (birth to adolescence) communicative disorders. Students in this concentration will also achieve competence in developmental psycholinguistics emphasizing language acquisition in normally developing children. The *Multilingualism*

concentration is intended to provide education in cross-linguistic, ethnographic, and other comparative studies of communicative disorders in children and/or adults, including those associated with bilingualism and second-language acquisition (including acquisition of sign language in deaf individuals). All students will be required to take some courses in each of the three concentrations. In addition, each student will elect a *methods minor*, applying one of the new technologies of cognitive neuroscience to research on language and communicative disorders. These may include computer-controlled studies of language processing in real-time functional brain imaging (including event-related brain potentials and/or functional magnetic resonance imaging), or neural-network simulations of communicative disorders.

The program is designed as a five-year curriculum, based on a twelve-month academic year. Students will be admitted to the doctoral program only in the fall semester/quarter. Information regarding admission is found in the current edition of the *Bulletin of the Graduate Division* of San Diego State University. To receive an application for admission, contact: SDSU/UCSD Joint Doctoral Program in Language and Communi-cative Disorders, San Diego State University, 5500 Campanile Drive, San Diego, California 92182-1518, (619) 594-6775.

Required courses include the *Tools* requirement (two courses in statistics/research design, a course in neuroanatomy and physiology, a course in language structure and theory and a professional survival skills course), the *Foundations* requirement (three courses on normal language and three courses on disorders of language) and the *Electives* requirement (at least five courses, with a minimum of three courses related to the chosen concentration, chosen from a broad list of approved options from Anthropology, Cognitive Science, Communicative Disorders, Computer Science, Linguistics, Neurosciences, and Psychology). Consult with adviser for approved list of elective courses. The five required electives must be approved by the student's adviser and the Doctoral Program Coordinators. In addition to their *course requirements, students are required* to complete three laboratory rotations in different research methodologies (each lasting a minimum of one quarter), two research projects (first year and second year), a qualifying examination for advancement to candidacy, and a dissertation proposal in the form of grant proposal to one of the public agencies that funds research in communicative disorders.

Ph.D. Time Limit Policies

Students must be advanced to candidacy by the end of four years. Total university support cannot exceed seven years. Total registered time at UCSD cannot exceed eight years.

COURSES

(See individual departments for details; for courses available at SDSU, see *SDSU Graduate Catalogue*.)

Tools Requirement:

Quantitative Methods
Psychology 201A-B-C

Ethics and Survival Skills in Academia
Cognitive Science 241

Neuroanatomy and Neurophysiology
Cognitive Science 201 or Basic Neurology SOMC 205

Language: Theories and Methods in the Study of Cognitive Phenomena
Cognitive Science 203 or Introduction to Grammatical Theory (Linguistics 221A) and
Introductory Phonology (Lingusitics 211A)

Foundations Requirement:

Special Topics in Psycholinguistics
Psychology 244

Aphasia
Cognitive Science 251 or Psychology 245

Language Acquisition
Psychology 215 or Cognitive Science 256

Electives:

Cognitive Science
202: Foundations: Computational Modeling of Cognition
211A-B-C: Research Methods in Cognitive Science
213: Issues in Cognitive Development
260: Seminar on Special Topics
272: Topics in Theoretical Neurobiology
273: Biological Basis of Attention

Communication
200A: Communication as Social Force
200B: Communication and Culture
200C: Communication and the Individual
201B: Ethnographic Methods for Communication Research
201C: Discourse Analysis
222: Childhood and Culture

Linguistics
211A: Introductory Phonology[1]
221A: Introduction to Grammatical Theory[1]
225: Topics in Syntax
249: Topics in Sign Languages of the Deaf
270: Psycholinguistics
272: Topics in Neurolinguistics
278: Research in Second Language Acquisition

Psychology
218A-B: Cognitive Psychology
222: Biological Psychology
227: Cognitive Development
236: Substance Abuse
242A-B-C: Research Topics in Developmental Psychology
244: Special Topics in Psycholinguistics
252: Seminar on Cognitive Neuroscience
254: Functional Brain Imaging
264A-B-C: Advanced Topics in Language Processes

Computer Science and Engineering
250A-B: Artificial Intelligence
253: Neural Networks
256: Statistical Natural Language Processing
258A: Connectionist Natural Language Processing

Neurosciences:
243: Physiological Basis of Human Information
263: Developmental Neurobiology
264: Behavioral Neuroscience

Philosophy:
234: Philosophy of Language

[1]Students who use this course to fulfill the Tools requirement may not use this as an elective.

Latin American Studies

OFFICE:
Room 1, Gildred Latin American Studies Building, Institute of the Americas Complex
http://orpheus.ucsd.edu/las

Professors

Guillermo D. Algaze, Ph.D., *Anthropology*
Robert R. Alvarez, Ph.D., *Ethnic Studies*

Charles Briggs, Ph.D., *Ethnic Studies, Program Director*
Jaime Concha, Ph.D., *Literature*
Wayne A. Cornelius, Ph.D., *Political Science*
Peter Cowhey, Ph.D., *International Relations and Pacific Studies*
Paul W. Drake, Ph.D., *Political Science*
Richard Feinberg, Ph.D., *International Relations and Pacific Studies*
Grant Goodall, Ph.D., *Linguistics*
Ramón Gutiérrez, Ph.D., *Ethnic Studies*
Stephan Haggard, Ph.D., *International Relations and Pacific Studies*
Daniel Hallin, Ph.D., *Communication*
Gordon Hanson, Ph.D., *International Relations and Pacific Studies*
Louis Hock, M.F.A., *Visual Arts*
Jorge Huerta, Ph.D., *Theatre and Dance*
Christine Hunefeldt, Ph.D., *History*
David Mares, Ph.D., *Political Science*
Michael Monteón, Ph.D., *History*
James E. Rauch, Ph.D., *Economics*
David Ringrose, Ph.D., *History*
Rosaura Sánchez, Ph.D., *Literature*
Matthew Shugart, Ph.D., *International Relations and Pacific Studies*
Harold Simon, M.D., *Family and Preventive Medicine, Emeritus*
Peter H. Smith, Ph.D., *Political Science*
Eric Van Young, Ph.D., *History*
Carlos Waisman, Ph.D., *Sociology*
Kathryn Woolard, Ph.D., *Anthropology*
Ana Celia Zentella, Ph.D., *Ethnic Studies*

Associate Professors

Robert Cancel, Ph.D., *Literature*
Ann Craig, Ph.D., *Political Science*
Anthony Curiel, Ph.D., *Theatre and Dance*
Ross H. Frank, Ph.D., *Ethnic Studies*
Rosemary George, Ph.D., *Literature*
Paul S. Goldstein, Ph.D., *Anthropology*
David Gutiérrez, Ph.D., *History*
James Holston, Ph.D., *Anthropology*
George Mariscal, Ph.D., *Literature*
John C. Moore, Ph.D., *Linguistics*
Elizabeth Newsome, Ph.D., *Visual Arts*
Max Parra, Ph.D., *Literature*
Pamela Radcliff, Ph.D., *History*
Marta Sánchez, Ph.D., *Literature*
Christopher Woodruff, Ph.D., *International Relations and Pacific Studies*
Olga A. Vásquez, Ph.D., *Communication*
León Zamosc, Ph.D., *Sociology, Associate Program Director*

Assistant Professors

Eric J. Baković, Ph.D., *Linguistics*
John D. Blanco, Ph.D., *Literature*
Hoyt Bleakley, Ph.D., *Economics*
Geoffrey Braswell, Ph.D., *Anthropology*
Denise Ferreira da Silva, Ph.D., *Ethnic Studies*
Brian Goldfarb, Ph.D., *Communication*
Sara Johnson, Ph.D., *Literature*
Milos Kokotovic, Ph.D., *Literature*
Andrew Lakoff, Ph.D., *Sociology*
Keith McNeal, Ph,D., *Anthropology (Acting)*
Natalia M. Molina, Ph.D., *Ethnic Studies*
Marc-Andreas Muendler, Ph.D., *Communication*
Nancy Grey Postero, Ph.D., *Anthropology*
Roberto Tejada, Ph.D., *Visual Arts*
Elana Zilberg, Ph.D., *Communication*

Lecturers

Nohemi Lugo, M.A., *International Relations and Pacific Studies*
Sandra Pedregal, M.A., *International Relations and Pacific Studies*
Keith Pezzoli, Ph.D., *Lecturer, Urban Studies Program*
Vanda Poirier, M.A., *International Relations and Pacific Studies*

Affiliated Academic Staff

Harold Colson, M.F.A., *Librarian, International Relations and Pacific Studies*
Karen Lindvall-Larson, M.L.S., *Librarian, Geisel Library*
Dean Sidelinger, M.D., *Research Fellow, Pediatrics*
Maria Zuniga, Ph.D., *Administrative Assistant, Pediatrics*

The Latin American Studies Program

UCSD's program in Latin American Studies has attained national and international distinction for its excellence in teaching, research, and public service. Each year its faculty offers approximately 100 Latin America-related courses in fourteen academic departments, and the Latin American Studies Program offers three interdisciplinary degrees:

- Bachelor of Arts in Latin American Studies
- Minor in Latin American Studies
- Master of Arts in Latin American Studies

Latin American Studies at UCSD offers distinct advantages:

- At the undergraduate level, students may take elective courses on Latin American topics or pursue a minor or a B.A. degree in Latin American Studies. At the graduate level, they can work on Latin America through interdisciplinary master's programs or through doctoral programs in academic departments.
- Latin American Studies integrates teaching, research, and policy analysis, encouraging students to develop interdisciplinary perspectives and to work actively with faculty on research projects and conferences.
- Students participate in the activities of an outstanding array of research and teaching organizations, including the Center for Iberian and Latin American Studies, the Center for U.S.-Mexican Studies, the Graduate School of International Relations and Pacific Studies, and the Institute of the Americas. The Center for Iberian and Latin American Studies (CILAS) sponsors multidisciplinary colloquia, conferences, projects, and publications. CILAS also awards fellowships and grants each year to promising graduate students.
- Students are encouraged to interact with visiting Latin American scholars and to participate in Latin America-related internships, seminars, clubs, foreign exchange programs, and other extracurricular activities.
- Students at UCSD have access to one of the largest and fastest-growing library collections on Latin America in the United States.

Degree programs in Latin American Studies are supervised by an interdisciplinary faculty group under the direction of the director and associate director of the Center for Iberian and Latin American Studies.

The Curricular Program

Undergraduate Major in Latin American Studies

The Bachelor of Arts in Latin American Studies blends coverage of methodological and theoretical approaches to the study of Latin America with a broad foundation in the humanities and social sciences. Students receiving this degree will be prepared for private and government employment or for graduate training; the major also provides a valuable supplement for those who

subsequently pursue professional degrees in business, law, engineering, medicine, or other fields.

To satisfactorily complete the B.A. degree, students must take a broad range of courses from at least three of UCSD's humanities and social science departments. The collection of courses should be structured so as to provide both depth in a special area of study and breadth across the broader field. Students must also demonstrate proficiency in Spanish.

All students entering the major must enroll in LATI 50 "Introduction to Latin America," an interdisciplinary course that prepares majors to build a coherent curriculum on Latin America. During the senior year, all B.A. candidates are required to successfully complete LATI 190, a writing seminar. This course will culminate in the preparation of an interpretive paper based on the secondary analysis of existing scholarly research (approximately twenty to forty pages in length). As part of the overall requirements, students are strongly encouraged to enroll in four credits of Individual Study (LATI 199) with a member of the Latin Americanist faculty, who will serve as the student's principal adviser.

All upper-division courses applied to the requirements of the major must be taken for a letter grade (with the sole exception of LATI 199). A 2.0 grade-point average is required in the major, and students must earn at least a C– in each course counted for the major.

Students majoring in Latin American Studies are also urged to minor in a core discipline such as anthropology, economics, history, literature, political science, or sociology. In summary, the requirements for the bachelor of arts in Latin American Studies are:

LOWER-DIVISION REQUIREMENTS

1. The equivalent of at least two years of college-level language instruction in Spanish, comparable to satisfactory completion of Literature/Spanish 2C; students who satisfy this requirement are strongly encouraged to study Portuguese.
2. LATI 50: Introduction to Latin America

UPPER-DIVISION REQUIREMENTS

1. Eleven upper-division courses selected from the approved interdisciplinary course list for Latin American Studies as follows:
   a. Course work must be in at least three departments.
   b. At least three courses must be from one department.
   c. No more than five courses from one department will count for credit.
   d. At least two courses must concentrate exclusively on periods earlier than the twentieth century.
2. Enrollment in the four-credit Senior Seminar (LATI 190), usually to be taken in the winter quarter of the senior year; satisfactory completion of a substantial paper is required of all graduating majors.
3. Maintain a 2.0 grade-point average, earning at least a C– in each course counting for the major. With the sole exception of LATI 199, all courses must be taken for a letter grade.

Honors in Latin American Studies

The Latin American Studies Program offers an Honors Program for students who demonstrate excellence in the major. In order to receive Honors in Latin American Studies a student must:

1. Satisfy all lower-division requirements of the major program;
2. Complete nine upper-division courses selected from the Approved Interdisciplinary Course List for Latin American Studies as follows:
   a. Course work must be in at least three departments.
   b. At least three courses must be from one department.
   c. No more than five courses from one department will count for credit.
   d. At least two courses must concentrate exclusively on periods earlier than the twentieth century.
3. Complete a three-course sequence in the senior year consisting of Individual Study, the Senior Seminar, and the Honors Seminar (LATI 199, 190, and 191, respectively);
4. Produce an original thesis based on primary research under the direction of a mentor selected from the Latin Americanist faculty, and defend this thesis during the spring quarter before an interdisciplinary faculty committee; and
5. Maintain a minimum GPA of 3.5 in the major.

Undergraduate Minor in Latin American Studies

The Latin American Studies minor allows students to explore interdisciplinary approaches to a significant world region while pursuing a major in an academic discipline. To complete the program, students take at least six Latin America-related courses in the humanities and social sciences all taken for a letter grade; five of these courses must be at the upper-division level. Students must also complete the equivalent of two years of college-level Spanish or Portuguese.

Education Abroad

Students in Latin American Studies are encouraged to participate in the Education Abroad Program (EAP) in Brazil, Chile, Costa Rica, or Mexico, or in other study abroad programs offered by the Opportunities Abroad Program (OAP). Subject to approval by petition after courses have been completed (based on syllabi and coursework), courses taken through EAP/OAP will be accepted for credit toward the major or minor. The equivalent of six UCSD upper-division courses can be petitioned for credit toward the major, and a maximum of two UCSD upper-division courses can be petitioned for credit toward the minor.

Students interested in studying abroad should see the Latin American Studies Student Affairs coordinator to discuss appropriate courses and programs for their plan of study before they leave. Information on EAP/OAP is given in the Education Abroad Program section of the *UCSD General Catalog.* Interested students should contact the Programs Abroad Office in the International Center and visit its Web site at http://www.ucsd.edu/icenter/pao. Financial aid can be used for EAP/OAP study, and special study abroad scholarships are also available.

Master of Arts in Latin American Studies

The Master of Arts in Latin American Studies is designed for students who seek to integrate a broad range of disciplinary approaches to a world region of growing international significance. Upon graduation, most students pursue additional advanced degrees in academic or professional fields; others proceed to careers in the private sector, in international organizations, or in government.

To qualify for admission, students must have a B.A. with a grade-point average of at least 3.5 on a 4.0 scale for the final two years of undergraduate study plus satisfactory scores on the Graduate Record Examination.

To receive the Master of Arts in Latin American Studies, a student must:

1. Demonstrate foreign language competence in Spanish or Portuguese;
2. Maintain a 3.0 GPA in 40 units of coursework (about ten courses) to be completed as follows:
   a. Complete the Latin American Studies Basic Seminar Sequence: 8 units must be taken in the required Core Seminar in Latin American Studies (LATI 200, 4 units), and Latin American Library Resources and Research Methodology (LATI 210A and LATI 210B, 2 units each).
   b. Courses must be completed in at least three fields, with no more than 16 units in any one department. Students are encouraged to include four units of independent research (LATI 299) for work on the master's thesis.
   c. At least 16 units must be taken in graduate-level courses, and up to 16 units may be taken in upper division, undergraduate-level courses.
3. Successfully complete either a comprehensive exam or master's thesis.

M.A. students have the option to upgrade upper-division, undergraduate-level courses to graduate-level courses (contact the Latin American Studies Student Affairs coordinator for information on requirements and procedures). To convert an undergraduate-level course (100 level) into a 298 graduate-level course, a student must attend all of the course meetings and incorporate a component of additional, graduate-level research work, upon arrangement with the faculty member teaching the course (a special form describing the supplementary work must be filled by the student and approved by the instructor and CILAS' academic coordinator). In all such cases, the supplementary work should, (a) increase the amount of reading to match the regular reading expectations of a graduate seminar, (b) include additional meeting time with the professor for a graduate-level discussion of the material, and (c) require the student to write a research paper (which would generally be on the order of fifteen to twenty pages).

Disciplinary and Thematic Concentrations

M.A. students in Latin American Studies who are interested in specific disciplines or research topics may apply for a disciplinary or thematic concentration. Currently students may choose from concentrations in gender studies, international migration, history, and sociology.

In addition to the general requirements for all candidates applying for admission to the Master of Arts in Latin American Studies, applicants to a concentration must submit a statement explaining their intellectual and career interests in that specific area of study. Applications from new students will be considered for the fall quarter. Current students in the Latin American Studies master's program may apply in the spring quarter of their first year.

M.A. students who were previously enrolled as undergraduates at UCSD will not be allowed to repeat courses for credit toward the concentration. In all cases there are alternatives, and those students will be expected to take other classes to fulfill the requirements.

General Concentration Requirements

To receive the Master of Arts in Latin American Studies with a concentration, a student must:

1. Demonstrate foreign language competence in Spanish or Portuguese.
2. Maintain a 3.0 GPA in 40 units of coursework (about ten courses) to be completed as follows:
   a. Complete the Latin American Studies Basic Seminar Sequence: 8 units must be taken in the required Core Seminar in Latin American Studies (LATI 200, 4 units), and Latin American Library Resources and Research Methodology (LATI 210A and LATI 210B, 2 units each).
   b. Complete 16 units within the specifications of the concentration (as specified below). All of the concentration units must be taken at the graduate level (200 level), and a maximum of two undergraduate-level courses (100 level) may be upgraded to graduate-level 298 courses.
   c. Complete 16 units of general electives within the specification of the concentration (as specified below). At least 50 percent of the general elective units must be taken at the graduate level (200 level).
3. Successfully complete a master's thesis on a topic relevant to the area of concentration.

Concentration in Gender Studies

To receive the Master of Arts degree in Latin American Studies (gender studies), a student must complete the following units as concentration course work and general electives:

1. One general theoretical course in gender studies (4 units in any of the following: ANGR 244, CGS 100, CGS 101, CGS 104, CGS 112, COCU 132, COCU 139, ETNH 256, LTCS 250, SOCB 118, SOCC 132, SOCC 267).
2. One course in feminist theory (4 units in any of the following: CGS 103, COCU 138, HIGR 205, POLI 116A, POLI 217).
3. One course focused on gender studies in Latin America (4 units in any of the following: ETHN 129, ETHN 148, HILA 261, LTAM 105, LTAM 106, LTSP 175, USP 135).
4. One course of directed reading (298, 4 units), taken with a faculty member affiliated with the CGS Program, focused on a topic relevant to Latin American gender studies.
5. General Electives: The remaining 16 units must be taken as follows: two courses from the approved list of courses on Latin America (8 units), 4 units of directed reading (298), and 4 units of independent research (299).

Concentration in History

To receive the Master of Arts degree in Latin American Studies (history), a student must complete the following units as concentration course work and general electives:

1. A required research seminar sequence in Latin American history (8 units in any of the following: HIGR 245A-B-C, HIGR 247A-B, or HIGR 248A-B).
2. Two elective courses or seminars in Latin American history (8 units in any two of the following: ETHN 130, ETHN 131, ETHN 180, ETHN 259, HILA 100, HILA 101, HILA 102, HILA 107, HILA 108, HILA 112, HILA 113, HILA 115, HILA 120, HILA 121, HILA 122, HILA 123, HILA 125, HILA 131, HILA 132, HILA 160/260, HILA 161/261, HILA 162/262, HILA 166/266, HILA 170/270, HILA 171/271, HIGR 245A-B-C, HIGR 247A-B, HIGR 248A-B, HIGR 249, HIGR 250, HIGR 251, HIGR 252, HIUS 158, HIUS 159, HIUS 167/267, LTSP 116, LTSP 135A).

3. General Electives: The remaining 16 units must be taken in departments other than the Department of History as follows: two courses from the approved list of courses on Latin America (8 units), 4 units of directed reading (298), and 4 units of independent research (299).

Concentration in International Migration

To receive the Master of Arts degree in Latin American Studies (international migration), a student must complete the following units as concentration course work and general electives:

1. One course focused on economic and social factors in international migration (4 units in any of the following: ECON 114, ETHN 118, ETHN 131, ETHN 134, HIUS 159, IRGN 490, POLI 248, SOCG 282).
2. One course focused on immigration policy (4 units in any of the following: POLI 150, POLI 236, IRGN 490).
3. One course focused on Latin American international migration (4 units in any of the following: COHI 175, ETHN 189, HIUS 180, HIUS 186, IRGN 490, LTAM 109, LTSP 177).
4. One course of directed reading (4 units in a 298 course, focused on a topic relevant to Latin American migratory movements).
5. General Electives: The remaining 16 units must be taken as follows: two courses from the approved list of courses on Latin America (8 units), 4 units of directed reading (298), and 4 units of independent research (299).

Concentration in Sociology

To receive the Master of Arts degree in Latin American Studies (sociology), a student must complete the following units as concentration course work and general electives:

1. One seminar in classical sociological theory (4 units in SOC 201A or SOC 201B).
2. One seminar in sociological research methods (4 units in any of the following: SOC 203, SOC 204, SOC 205, SOC 206, SOC 207, SOC 227).
3. One core sociological field seminar (4 units in any of the following: SOC 212, SOC 216, SOC 222, SOC 226, SOC 234, SOC 244, SOC 264, SOC 267).
4. One sociology course or seminar focused on Latin America (4 units in any of the following: SOCD 182, SOCD 188D, SOCG 258).
5. General Electives: The remaining 16 units must be taken in departments other than the Department of Sociology as follows: two courses from the approved list of courses on Latin America (8 units), 4 units of directed reading (298), and 4 units of independent research (299).

COURSES

LATI 50. Introduction to Latin America (4)
Interdisciplinary overview of society and culture in Latin America—including Mexico, the Caribbean, and South America: legacies of conquest, patterns of economic development, changing roles of women, expressions of popular culture, cycles of political change, and U.S.-Latin American relations.

LATI 50XL. Foreign Language Discussion—Introduction to Latin America (1)
Students will exercise advanced foreign language skills to discuss materials and the correspondingly numbered Latin American Studies foreign area course. This section is taught by the course instructor, has no final exam, and does not affect the grade in the core course, LATI 50.

LATI 87. Freshman Seminar (1)
The Freshman Seminar Program is designed to provide new students with the opportunity to explore an intellectual topic with a faculty member in a small seminar setting. Freshman seminars are offered in all campus departments and undergraduate colleges, and topics vary from quarter to quarter. Enrollment is limited to 15 to 20 students, with preference given to entering freshmen.

LATI 120/220. Special Topics in Latin American Studies (1-4)
A course designed to cover various aspects and various disciplines of Latin American Studies.

LATI 190. Senior Seminar (4)
Research seminar on selected topics in the study of Latin America; all students will be required to prepare and present independent research papers. (Honors students will present drafts of senior research theses, of no less than fifty pages in length; non-honors students will present final versions of analytical papers of approximately twenty-five to forty pages in length.) *Prerequisites: satisfactory completion of LATI 50 and a working knowledge of Spanish.*

LATI 191. Honors Seminar (4)
Independent reading and research under direction of a member of the faculty group in Latin American Studies; goal is to provide honors students with an opportunity to complete senior research thesis (to be defended before three-person interdisciplinary faculty committee). *Prerequisites: successful completion of LATI 50, working knowledge of Spanish; minimum GPA of 3.5 in the major.*

LATI 199. Individual Study (4)
Guided and supervised reading of the literature on Latin America in the interdisciplinary areas of anthropology, communications, economics, history, literature, political science, and sociology. For students majoring in Latin American Studies, reading will focus around potential topics for senior papers; for honors students in Latin American Studies, reading will culminate in formulation of a prospectus for the research thesis. *Prerequisites: LATI 50 and working knowledge of Spanish.*

LATI 200. Core Seminar on Interdisciplinary Research and Methodology in Latin American Studies (4)
A team-taught course wherein members of the faculty group in Latin American Studies present diverse disciplinary and thematic approaches to the region. Topics vary from year to year. Grades are based on discussions and on a series of analytical papers. *Prerequisite: enrollment in the master's degree program in Latin American Studies or permission of instructor.*

LATI 210A-B. Latin American Library Resources & Research Methodology (2-2)
A detailed survey of major research methods and resources for the study of Latin America. Both conventional library materials and those available electronically will be explored. Skills will transfer to any major research library. Various methodologies will also be explored in relation to the students' individual projects. A critical review, annotated bibliography, and a statement of research methodology, related to their proposed topics, will be required.

LATI 298. Directed Reading (1–12)
Guided and supervised reading of the literature of the several areas included in the interdisciplinary fields of anthropology, communications, economics, history, literature, political science, and sociology. *Prerequisite: graduate standing in Latin American Studies.*

LATI 299. Independent Research (1–12)
Independent work by graduate students engaged in thesis research and writing under the direct supervision of a faculty adviser.

LATI 500. Teaching Apprenticeship (1-4)
The course is designed for teaching assistants to learn effective teaching methods through supervision and mentorship by the faculty. Student will learn handling of discussions; preparation and grading of examinations and other written exercises; and student relations.

COURSES THAT SATISFY UNDERGRADUATE/ GRADUATE DEGREE REQUIREMENTS IN LATIN AMERICAN STUDIES

Approved Interdisciplinary Courses: The following is a list of courses available in UCSD departments that are approved to satisfy the requirements of the major, minor, and master's in Latin American Studies. Please note that these courses may not be offered every quarter or year and new courses may be added. Check the current schedule of classes or the Latin American Studies Web site (http://orpheus.ucsd.edu/las) for updated information.

The Departments of Linguistics and Literature and the Graduate School of International Relations and Pacific Studies offer language courses in Spanish and Portuguese. **Language courses do not count toward the course requirements** for Latin American Studies degrees.

Anthropology

ANRG 100	Special Topics *(when Latin American content)*
ANRG 114	Urban Cultures in Latin America
ANRG 121	The Archaeology of South America
ANRG 126	Rise of New World Civilizations: Mesoamerica and the Andes
ANRG 132	Modernity in Brazil
ANRG 143	Indigenous Peoples of Latin America
ANGR 269	Current Readings on Latin America

Communication

COCU 110	Cinema in Latin America: Visions of a Continent in Transition
COHI 114	Bilingual Communication
COSF 140C	Comparative Media Systems: Latin America and the Caribbean

Economics

ECON 161	Latin American Economic Development

Ethnic Studies

ETHN 116	The United States-Mexico Border in Comparative Perspective
ETHN 117	Organic Social Movements
ETHN 129	Asian and Latina Immigrant Workers in the Global Economy
ETHN 130	Social and Economic History of the Southwest I
ETHN 131	Social and Economic History of the Southwest II
ETHN 132	Chicano Dramatic Literature
ETHN 133	Hispanic American Dramatic Literature
ETHN 135A	Early Latino/a-Chicano/a Cultural Production, 1848–1960
ETHN 135B	Early Latino/a-Chicano/a Cultural Production, 1960–Present
ETHN 136	Topics in Chicano/a-Latino/a Cultures
ETHN 138	Chicano/a and Latino/a Poetry
ETHN 139	Chicano Literature in English
ETHN 144	Bilingual Communities in the U.S.A.
ETHN 145	Spanish Language in the United States
ETHN 148	Latino/a and Chicano/a Literature
ETHN 180	Special Topics in Mexican-American History
ETHN 189	Special Topics in Ethnic Studies

History

HIEU 138	Imperial Spain, 1476–1808
HILA 100	Latin American Colonial Transformation
HILA 101	Latin American Independence 1810–1898
HILA 102	Latin America in the Twentieth Century
HILA 107	State and Society in Nineteenth and Twentieth Century Latin America
HILA 113	Lord and Peasant in Latin America
HILA 115	Latin American City, A History
HILA 120	History of Argentina
HILA 121	History of Brazil
HILA 122	Cuba: From Colony to Socialist Republic
HILA 123	The Incas and Their Ancestors
HILA 125	History of Childhood in Latin America
HILA 131	History of Mexico in the Nineteenth Century
HILA 132	History of Contemporary Mexico
HILA 160/260	Topics in Latin American Colonial History 1500–1820
HILA 161/261	History of Women in Latin America
HILA 162/262	Special Topics in Latin American History
HILA 166/266	Cuba: From Colony to Socialist Republic
HILA 170/270	Topics in Latin American History, 1820–1910
HILA 171/271	Special Topics in Latin American History since 1910
HIUS 117	History of Los Angeles
HIUS 158	Social and Economic History of the Southwest I
HIUS 159	Social and Economic History of the Southwest II
HIGR 245ABC	Seminar in the Literature of Latin American History
HIGR 247AB	Readings and Seminar on Colonial Latin America
HIGR 248AB	Readings and Seminar on Latin America, National Period
HIGR 249	Topics in Colonial Latin America
HIGR 250	Topics in the National Period of Latin America
HIGR 251	Topics in the History of Mexico
HIGR 252	History, Social Evolution, and Intellectuals in the Andes

International Relations and Pacific Studies

IRGN 409	Economic Policy in Latin America
IRGN 454	Current Issue/US-Latin American Relations
IRGN 476	Doing Business in Latin America
IRGN 477	Latin American Politics
IRGN 479	Politics and Institutions in Latin America
IRGN 480	Policy-Making in Latin America
IRGN 490	Special Topics (with Latin American content)

Latin American Studies

LATI 50	Introduction to Latin America
LATI 50XL	Foreign Language Discussion—Introduction to Latin America
LATI 87	Freshman Seminar
LATI 120	Special Topics in Latin America
LATI 190	Senior Seminar
LATI 191	Honors Thesis Seminar
LATI 199	Independent Study
LATI 200	Core Seminar in Latin American Studies
LATI 210AB	Latin American Library Resources
LATI 220	Special Topics in Latin America
LATI 298	Directed Reading
LATI 299	Independent Research
LATI 500	Teaching Apprenticeship

Literature

LTAM 100	Latino/a Cultures in the United States
LTAM 101	Early Latino/a-Chicano/a Cultures: 1848–1960
LTAM 102	Contemporary Chicano/a-Latino/a Cultural Production: 1960 to Present
LTAM 104	Cultures of the U.S./Mexico Border Region
LTAM 105	Gender and Sexuality in Latino/a Cultural Production
LTAM 106	Modern Chicana and Mexican Women Writings
LTAM 107	Comparative Latino/a and U.S. Ethnic Cultures
LTAM 108	Chicano/a and Latino/a Cultures: Intellectual and Political Traditions
LTAM 109	Cultural Production of the Latino/a Diasporas
LTAM 110	Latin American Literature in Translation
LTAM 120	Mexican Literature in Translation
LTEN 29	Introduction to Chicano Literature
LTEN 180	Chicano Literature in English
LTEN 188	Contemporary Caribbean Literature
LTSP 50BC	Readings in Latin American Topics
LTSP 107	Literature of the Fifteenth Century
LTSP 119ABC	Cervantes
LTSP 130B	Development of Latin American Literature
LTSP 133	Spanish American Literature: Twentieth Century
LTSP 134	Argentine Literature
LTSP 135A	Mexican Literature Before 1910
LTSP 135B	Modern Mexican Literature
LTSP 136	Peruvian Literature
LTSP 137	Caribbean Literature

LTSP 140	Spanish American Novel
LTSP 141	Spanish American Poetry
LTSP 142	Spanish American Short Story
LTSP 150A	Early Latino/a-Chicano/a Cultural Production, 1848–1960
LTSP 150B	Early Latino/a-Chicano/a Cultural Production, 1960–Present
LTSP 151	Topics in Chicano/a-Latino/a Cultures
LTSP 153	Chicano/a and Latino/a Poetry
LTSP 154	Latino/a and Chicano/a Literature
LTSP 162	Spanish Language in the United States
LTSP 170	Contemporary Theories of Cultural Production
LTSP 172	Indigenista Themes in Spanish American Literature
LTSP 173	Problems in Spanish and Spanish American Literary History
LTSP 175	Gender, Sexuality, and Culture
LTSP 176	Literature and Nation *(when Latin American content)*
LTSP 177	Literary and Historical Migrations
LTSP 190	Seminar
LTSP 224	Golden Age Studies
LTSP 252	Studies in Modern Hispanic Literature and Culture
LTSP 258	Spanish American Prose
LTSP 272	Literature and Society Studies
LTSP 275	Latin American Literature/Literary and Cultural Theory Since the 60s

Music

MUS 111	Topics/World Music Traditions *(when Latin American content)*

Political Science

POLI 134AA	Comparative Politics of Latin America
POLI 134BC	Politics in Mexico
POLI 134D	Selected Topics in Latin American Politics
POLI 134N	Politics in Central America
POLI 134R	Political Parties in Latin America
POLI 145A	International Politics and Drugs
POLI 146A	US and Latin America: Political and Economic Relations
POLI 146E	US and Latin American Relations: Security Issues
POLI 150AB	Politics of Immigration
POLI 154	Special Topics in International Relations *(when Latin American content)*
POLI 229	Special Topics: Comparative Politics *(when Latin American content)*
POLI 230A	The Mexican Political System
POLI 236	Immigration Policy and Politics
POLI 248	Special Topic/International Relations: Latin American Foreign Policy

Sociology

SOCD 182	Ethnicity and Indigenous Peoples in Latin America
SOCD 188D	Latin America: Society and Politics
SOCD 189	Ethnicity in Latin America
SOCG 258	Institutional Change in the Contemporary World; Latin Americana Socities in a Comparative Perspective

Theatre and Dance

THGE 125	Topics in Theatre and Film: Latin American Films
THHS 101	Gay/Lesbian Themes in Latino Theatre
THHS 108	Luis Valdez
THHS 110	Chicano Dramatic Literature
THHS 111	Hispanic American Dramatic Literature
THHS 112	Gay and Lesbian Themes in U.S. Latino Theatre
THDA 132	Dances of the World: Latin American Dances
THDA 133	Advanced Dances of the World: Latin American Dances

Third World Studies

TWS 22	Latin American Literature
TWS 24	Caribbean Literature

Urban Studies and Planning

USP 135	Asian and Latina Immigrant Workers in the Global Economy
USP 172	Planning/Policy-making: U.S.-Mexican Border Region

Visual Arts

VIS 21	Introduction to Non-Western Art
VIS 126AN	Pre-Columbian Art of Ancient Mexico and Central America
VIS 126BN	Art and Civilization/Ancient Maya
VIS 126G	Problems in Mesoamerican Art History
VIS 126H	Problems in Ancient Maya Iconography and Inscriptions
VIS 128CN	Special Problems in Modern Art History *(when Latin American content)*
VIS 128DN	Topics in Non-Western Art History
VIS 129CN	Special Problems in Modern Art History *(when Latin American content)*
VIS 129DN	Special Problems in Non-Western Art History *(when Latin American content)*

Latin Literature

See Literature.

Law and Society

OFFICE: Interdisciplinary Programs, Literature Building, Second Floor, Room 3238, Warren College

Law and society is an interdisciplinary minor that emphasizes the complexity and interrelationship of legal, social, and ethical issues in their historical context. Although it is administered by Warren College, it is available to all UCSD students considering law-related careers or those with a general interest in law as a social institution. The purpose of the program is to enhance students' critical analysis of social and ethical issues related to law and of the legal implications and ramifications of policy and decision-making in their major fields of study. Students examine the role of the legal system and specific legal issues from the perspectives of the social sciences and humanities. Social forces, historical questions, and issues of values will be considered in the context of the legal system. The focus of the minor is on the process of law—how the law both reflects and defines basic social values—and its relation to the political, economic, and social conflicts within society.

The interdisciplinary content of the law and society minor offers UCSD students the opportunity to examine law-related issues from the perspectives of a broad range of disciplines including: communication, economics, environmental studies, ethnic studies, history, linguistics, philosophy, political science, psychology, sociology, urban studies and planning, and critical gender studies.

Students should consult an academic adviser in their college provost's office to determine how the law and society minor can best meet their college's graduation requirements. Declarations must first be reviewed and approved by the coordinator of Interdisciplinary Programs and then by the students' college academic advising office.

Students are strongly urged to supplement the law and society minor with a law-related

internship. Both local and out-of-town internships are available to juniors and seniors with at least a 2.5 grade-point average (some placements require a 3.0 GPA) through the Academic Internship Program. The Academic Internship Program offers local placements with lawyers, judges, elected officials, government offices, and public interest groups. In addition, placements are available in Washington, D.C. with senators, representatives, legislative committees, and political action committees. Students may earn from four to sixteen units of academic credit for the internship experience. To apply AIP197 and courses in the UC/DC Program toward minor requirements, contact the Interdisciplinary Programs coordinator.

A number of extracurricular events and programs are also available to students interested in law. Information on these programs and activities is available in the Interdisciplinary Programs Office, Literature Building, Second Floor, Room 3238, Warren College, or call (858) 534-1704. Web site: http://warren.ucsd.edu/law

Law and Society Minor Requirements

The minor consists of seven courses, five of which must be upper-division, chosen from the courses listed below. To assure an interdisciplinary learning experience, students must include at least one course from each of the following academic departments: history, philosophy, political science, and sociology. Law and Society 101, Contemporary Legal Issues, may be counted as either political science or sociology, and may be repeated for credit once, for a maximum total of eight units.

Required Courses

1. Political Science 40–Introduction to Law and Society
2. Law and Society 101–Contemporary Legal Issues
3. One of the following four courses:
   History US 150–American Legal History to 1865
   History US 151–American Legal History since 1865
   Political Science 104A–The Supreme Court and the Constitution
   Political Science 104B–Civil Liberties—Fundamental Rights
4. One of the following two courses:
   Philosophy 168–Philosophy of Law
   Sociology/C-140–Sociology of Law

ELECTIVES CHOSEN FROM THE FOLLOWING:

Anthropology: General

100–Topics in Sociocultural Anthropology (approval required)

Communication/SF

139A-B–Law, Communication, and Freedom of Expression

Critical Gender Studies

106–Gender, Equality, and the Law
107–Gender and Reproductive Rights

Dimensions of Culture

2–Justice (open to Marshall College students)

Economics

118A-B–Law and Economics

Ethnic Studies

152–Law and Civil Rights

Environmental Studies

110–Environmental Law

History U.S.

152A–A Constitutional History of the U.S. to 1865
152B–A Constitutional History of the U.S. since 1865
153–American Political Trials
155A-B–Law and Religion in American History
169–American Legal and Constitutional History

Linguistics/General

105–Law and Language
176–Language of Politics and Advertising

Philosophy

10–Introduction to Logic
12–Logic and Decision Making
162–Contemporary Moral Issues
163–Bio-Medical Ethics
165–Professional Ethics
167–Contemporary Political Philosophy

Political Science

13–Power and Justice
104A–The Supreme Court and the Constitution
104B–Civil Liberties—Fundamental Rights
104C–Civil Liberties—The Rights of Criminals and Minorities
104D–Judicial Politics
104F–Constitutional Law Seminar
104I–Law and Politics—Courts and Political Controversy
104L–Positive Political Theory of Law
104M–Law and Sex
117–Violence and Social Order
140A–International Law and Organizations

Psychology

162–Psychology and the Law

Sociology

120S/B–Special Topics in Culture, Language, and Social Interaction (prior approval of topic required)
140F/C–Law and the Workplace
141/C–Crime and Society
142/B–Social Deviance
144/C–Forms of Social Control
146/B–Law Enforcement in America
145/B–Violence and Society
159/C–Special Topics in Social Organizations and Institutions (prior approval of topic required)
173/B–Elite Crime

Urban Studies and Planning

124–Land Use Planning

Students may petition to substitute courses in the minor that have substantial legal content. Petitions should be submitted to the Interdisciplinary Programs Office.

Recommended Internship Experience

Law-related internship (AIP 197): To be arranged at least one quarter in advance through the Academic Internship Program, Literature Building, Second Floor, Warren College. For each four units of credit, ten hours a week for one quarter and a ten-page research paper are required.

COURSES

As indicated above, most course work for the Law and Society minor is listed under the academic department providing instruction. Law and Society 101, described below, is an interdisciplinary course. It may be counted toward minor requirements as either political science or sociology. Further information on Law and

Society 101 is available in the Interdisciplinary Programs Office.

UPPER-DIVISION

101. Contemporary Legal Issues (4)
This course will deal in depth each year with a different legal issue of contemporary significance, viewed from the perspectives of political science, history, sociology, and philosophy. Required for students completing the law and society minor. May be repeated for credit once, for a maximum total of eight units.

Linguistics

OFFICE: 5237 McGill Hall, Muir College
http://ling.ucsd.edu

Professors

Farrell Ackerman, Ph.D.
Grant Goodall, Ph.D.
David M. Perlmutter, Ph.D., *Academic Senate Distinguished Teaching Award*
Maria Polinsky, Ph.D.

Associate Professors

Chris Barker, Ph.D.
Andrew S. Kehler, Ph.D.
Robert E. Kluender, Ph.D., *Chair*
John C. Moore, Ph.D.
Sharon Rose, Ph.D.

Assistant Professors

Amalia Arvaniti, Ph.D.
Eric J. Bakovic, Ph.D.

Professors Emeritus

Matthew Y. C. Chen, Ph.D.
Edward S. Klima, Ph.D.
S.-Y. Kuroda, Ph.D.
Ronald W. Langacker, Ph.D.
Margaret H. Langdon, Ph.D.
Leonard D. Newmark, Ph.D.
Sanford A. Schane, Ph.D.

In what ways do languages differ, and in what ways are all human languages alike? These are the basic questions that the science of linguistics seeks to answer.

In formulating hypotheses about language it has been found that languages have intricate structure at a number of different levels. Phonetics studies the sounds of speech and how they are produced and perceived. Phonology studies the principles by which the sounds of a language are organized into a system and combined into syllables and larger units. Morphology studies the principles by which smaller units of meaning are combined into words. Syntax is the study of the principles by which words are combined into larger units such as phrases and sentences. Semantics studies meaning—the meanings of words and the ways the meanings of words are related to the meanings of larger units such as the phrase, the sentence, and the discourse. Linguists attempt to discover to what extent the principles at each level vary across languages, and to what extent they are universal.

Because language provides a window into the human mind, linguistics plays a central role in the study of human cognition and figures prominently in the field of cognitive science. We know, for example, that all normal children succeed in learning language relatively quickly at a time when their other cognitive abilities are still developing. The universal properties of human language that linguists discover can be used to provide models of this process, to explain why it occurs so rapidly, and to make specific predictions about the way it unfolds. The results of linguistic research can also be tested directly in experimental studies of how language is represented and processed in the mind (psycholinguistics) and brain (neurolinguistics). Language can also be studied in terms of its function as a cognitive system shared by an entire society; sociolinguistics investigate the ways in which the language we use is affected by our social environment.

The department of Linguistics offers a series of lower-division courses designed to introduce non-majors to the scientific study of language in the broader perspective of a liberal arts education. These are LIGN 3 (Language as a Social and Cultural Phenomenon), LIGN 4 (Language as a Cognitive System), LIGN 7 (Sign Language and Its Culture), LIGN 8 (Languages and Cultures in America), and LIGN 17 (Making and Breaking Codes). These courses may be used to satisfy the Marshall College disciplinary breadth requirement. Lower-division linguistics courses may be used to satisfy the social sciences requirement at Muir College and Revelle College, and they partially fulfill the requirements for a program of concentration in Warren College. In addition, certain linguistics courses satisfy the American Cultures requirement in Revelle College and the cultural diversity requirement in Muir College and Warren College. LIGN 17 (Making and Breaking Codes) satisfies the Thurgood Marshall Computational Skills requirement in addition to the formal skills requirement in Warren College and in the Human Development Program. This course also satisfies the Structured Reasoning requirement in Sixth College. Students should consult their college advising offices to determine which linguistics courses satisfy these other requirements.

Linguistics courses are relevant to a wide range of fields of study at UCSD, including anthropology, cognitive science, communication, computer science, human development, law and society, psychology, and sociology, as well as areas such as African studies, Chinese studies, ethnic studies, Judaic studies, Latin American studies, and others. In some cases certain linguistics courses count toward a major or minor in one of these departments or programs. Students should consult with a faculty adviser in linguistics and the other department or program when deciding on their course of study.

Students are often able to participate in the UC Education Abroad Program (EAP) and UCSD's Opportunities Abroad Program (OAP) while still making progress toward the major. Students considerating this option should discuss their plans with the department undergraduate adviser before going abroad. Detailed information on EAP/OAP is found in this catalog under the heading "Education Abroad Program."

The Department of Linguistics oversees the Linguistics Langauge Program, which offers basic language instruction in Arabic, ASL, French, German, Italian, Portuguese, and Spanish. Courses from the Language Program satisfy general-education requirements, as well as the Department of Linguistics language requirement. Graduate students who require a reading knowledge of French or German may enroll in LIFR 11 or LIGM 11, respectively.

The department also offers language instruction for individuals who grew up in an English-speaking environment while speaking a different language at home (Arabic, Armenian, Cantonese, Hindi, Korean, Persian, Tagalog, and Vietnamese; other languages may be added to this list if student demand is sufficient). Instruction in these languages is designed to raise students' linguistic and cultural competence to professional levels. Finally, directed self-instruction is available for a wide variety of languages through LIDS 19.

Note: Please check with the department office for updates concerning programs and course offerings.

The Major Program

General Requirements

Every linguistics major (except the language studies major) must satisfy the undergraduate language requirement and must successfully complete a minimum of twelve upper-division courses, including six required courses and at least five upper-division linguistics electives. In addition to the general major, the department offers a set of enriched major programs in various specializations.

Except for LIGN 199, no course taken on a Pass/Not Pass basis may be counted toward a linguistics major. No more than one quarter of LIGN 199 may be counted toward a linguistics major. At least six of the required upper-division linguistics courses counted toward the major must be taken in residence at UCSD. A letter grade of C– or better is required for every course counted toward a linguistics major, including courses taken to satisfy the department's undergraduate language requirement.

Required Linguistics Courses

Linguistics 101 is required as an introduction to the field and serves as the prerequisite to certain other courses. Students who choose a linguistics major should enroll in it as early as possible.

Every major program in linguistics (except the language studies major) must include the following required courses covering basic areas of the field:

LIGN 101: Introduction to the Study of Language
LIGN 110: Phonetics
LIGN 111: Phonology I
LIGN 120: Morphology
LIGN 121: Syntax I
LIGN 130: Semantics

Students are advised to take these required courses as early as possible, since the background they provide may be needed for other upper-division linguistics courses. Check individual course listings for prerequisite information.

Linguistics Electives

LIGN 104: Language and Conceptualization
LIGN 105: Law and Language
LIGN 108: Languages of Africa
LIGN 140: The Structure of American Sign Language
LIGN 141: Language Structures
LIGN 142: Language Typology
LIGN 143: The Structure of Spanish
LIGN 144: Discourse Analysis: American Sign Language and Performing Arts
LIGN 145: Pidgins and Creoles
LIGN 146: Sociolinguistics in Deaf Communities
LIGN 150: Historical Linguistics
LIGN 165: Computational Linguistics
LIGN 169: Principles of Discourse and Dialog
LIGN 170: Psycholinguistics
LIGN 171: Child Language Acquisition
LIGN 172: Language and the Brain
LIGN 174: Gender and Language in Society
LIGN 175: Sociolinguistics
LIGN 176: Language of Politics and Advertising
LIGN 177: Multilingualism
LIGN 178: Second Language Teaching Methodology
LIGN 179: Second Language Acquisition Research

Restricted Courses

LIGN 195: Apprentice Teaching (does not count as a linguistics elective)
LIGN 197: Linguistics Internship
LIGN 199: Independent Study in Linguistics
LIGN 199H: Honors Independent Study in Linguistics

Note to Revelle and Warren students.

Revelle: For Revelle College only, the classification of the linguistics major as humanities, natural science, or social science must be determined on the basis of each student's specific program. The classification of the major program will in turn determine what areas will be acceptable for the noncontiguous minor.

Warren: For Warren College only, any courses taken in departments other than linguistics may not overlap with the student's outside area(s) of concentration.

Undergraduate Language Requirement

Linguistics majors must demonstrate proficiency in one foreign language.

Proficiency in a foreign language may be demonstrated in either of two ways:

1. By passing the reading proficiency examination and the oral interview administered by the Department of Linguistics in French, German, Italian, or Spanish; or
2. By successfully completing a course given at UCSD representing the fourth quarter (or beyond) of instruction in any single foreign language with a grade of C– or better.

Students are encouraged to satisfy this requirement as early as possible in order to be able to use the language for reference in linguistics courses. Students with native language competence in a language other than English may petition to have English count as satisfying the proficiency requirement.

General Major (12 courses)

The general major in linguistics requires satisfaction of the undergraduate language requirement and successful completion of twelve upper-division courses:

6 required linguistics courses:
LIGN 101
LIGN 110
LIGN 111
LIGN 120
LIGN 121
LIGN 130

5 linguistics electives

1 additional linguistics elective or upper-division course in another department pertaining to the study of language

Specialized Majors

Every student with a specialized major must consult the faculty adviser in the Department of Linguistics to have approved an individual curricular plan to satisfy the major requirements for the option chosen. Each specialized major requires satisfaction of the undergraduate language requirement and successful completion of upper-division requirements as specified below. The specialization will be reflected in the wording of a degree, e.g., "B.A. in Linguistics (with Specialization in Language and Society)."

Cognition and Language (12 courses)

6 required linguistics courses:
LIGN 101

LIGN 110
LIGN 111
LIGN 120
LIGN 121
LIGN 130

4 linguistics electives chosen from:

LIGN 104
LIGN 165
LIGN 170
LIGN 171
LIGN 172
LIGN 176
LIGN 179

2 additional courses from linguistics or other departments subject to adviser approval.

Courses currently approved to satisfy this requirement include the following (Note: some of these courses may have prerequisites):

Linguistics:

Any upper-division courses (except those used to fulfill requirements A and B).

Anthropology:

ANBI 140: The Evolution of the Human Brain
ANBI 159: Biological and Cultural Perspectives on Intelligence
ANBI 161: Human Evolution
ANBI 173: Cognition in Animals and Humans

Cognitive Science:

COGS 101C: Language
COGS 102A: Distributed Cognition
COGS 102B: Everyday Cognition
COGS 107C: Cognitive Neuroscience
COGS 108D: Programming Methods for Cognitive Science
COGS 108E: Neural Network Models of Cognition I
COGS 108F: Advanced Programming Methods for Cognitive Science
COGS 151: Analogy and Conceptual Systems
COGS 153: Language Comprehension
COGS 154: Communication Disorders in Children and Adults
COGS 156: Language Development
COGS 170: Natural and Artificial Symbolic Representational Systems
COGS 181: Neural Network Models of Cognition II
COGS 184: Modeling the Evolution of Cognition
COGS 191: Laboratory Research

Computer Science and Engineering:

CSE 133: Information Retrieval

Philosophy:

PHIL 110: Wittgenstein
PHIL 120: Symbolic Logic I
PHIL 121: Symbolic Logic II
PHIL 134: Philosophy of Language
PHIL 135: Meaning and Communication
PHIL 136: Philosophy of Mind
PHIL 150: Philosophy of the Cognitive Sciences

Psychology:

PSYC 105: Introduction to Cognitive Psychology
PSYC 118A: Real-Time Examination of Language Processing
PSYC 118B: Real-Time Examination of Language Processing
PSYC 119: Psycholinguistics/Cognition Laboratory
PSYC 145: Psychology of Language

LANGUAGE AND SOCIETY (12 COURSES)

6 required linguistics courses

2 appropriate upper-division courses in other departments (especially the Departments of Anthropology, Communication, Cognitive Science, or Sociology), selected in consultation with the faculty adviser for language and society

1 course in sociolinguistics (by approval of the faculty adviser, may be taken in another department)

3 linguistics electives. Courses particularly relevant to this specialization are:

LIGN 105: Law and Language
LIGN 175: Sociolinguistics
LIGN 176: Language of Politics and Advertising
LIGN 177: Multilingualism

Language Studies Major

Students majoring in language studies must consult with the language studies faculty adviser to approve an individual curricular plan.

The language studies major is designed for students who wish to pursue the study of a particular language from a variety of perspectives. To this end, students will take courses in linguistics and literature, as well as electives in linguistics, literature, culture, and area studies. This major provides preparation for a variety of careers that make use of second language skills. Depending on the elective emphasis, these include international business/law, teaching, translation, interpreting, linguistics, and foreign service. Each language studies major will specialize in one **language of concentration.** In principle, this could be any language other than English. However, some languages may require that some coursework be completed outside UCSD. **Hence, it is recommended that language studies majors consider a year abroad.** Students whose language of concentration is **American Sign Language** will need to consult the faculty adviser for individualized requirements; these students may also consider an exchange year at Gallaudet University.

Requirements:

Lower-division preparation:

- Two years of language instruction in the language of concentration, or equivalent proficiency
- Lower-division prerequisites for upper-division courses in the literature of the language of concentration

Upper-division requirements:

Note: At least two of the upper-division courses must be conducted in the language of concentration. Students are encouraged to increase their academic exposure to their language of concentration by taking one-unit seminars in the language and by participating in the EAP program.

A. 6 upper-division linguistics courses, as follows:
LIGN 101: Introduction to Linguistics

3 courses chosen from:
LIGN 104: Language and Conceptualization
LIGN 110: Phonetics
LIGN 111: Phonology I
LIGN 120: Morphology
LIGN 121: Syntax I
LIGN 130: Semantics
LIGN 150: Historical Linguistics

"Structure of" language of concentration (e.g., LIGN 143 Structure of Spanish). If no such course is available, then any upper-

division LIGN course or any course from another department (e.g., literature) that deals with the structure or history of the language of concentration may be substituted (subject to faculty approval).

One additional upper-division LIGN course.

B. 2 upper-division courses in the literature of the language of concentration

C. 4 additional upper-division courses that deal with general linguistics, the language of concentration (e.g., literature), or the corresponding culture/area studies (e.g., anthropology, economics, history, political science, sociology), subject to approval of the faculty advisor.

Approved courses for this requirement include the following (Note: some of these courses may have prerequisites):

Linguistics: Any upper-division courses (except those used to fulfill requirement A).

Literature: Any upper-division courses related to the language of concentration (except those used to fulfill requirement B)..

Area Studies: Approved courses are listed by language of concentration; other languages of concentration are possible in principle, but probably require coursework outside of UCSD.

ASL

COM/HIP 124: Voice: Deaf People in America

Chinese

ANRG 170: Traditional Chinese Society
ANRG 173: Chinese Popular Religion
HIEA 120: Classical Chinese Philosophy and Culture
HIEA 123: Food in Chinese History
HIEA 130: History of the Modern Chinese Revolution: 1800–1911
HIEA 132: History of the People's Republic of China
HIEA 137: Women and Family in Chinese History
HIEA 167: Special Topics in Modern Chinese History
POLI 130B: Politics in the People's Republic of China
POLI 131C: The Chinese Revolution
POLI 132B: Politics and Revolution in China and Japan
SOCD 158J: Religion and Ethics in China and Japan
SOCD 188B: Chinese Society

French

HIEU 129: Paris, Past and Present
HIEU 131: The French Revolution: 1789–1814
HIEU 153A-B: Nineteenth-Century France—Twentieth-Century France
POLI 120C: Politics in France

German

HIEU 132: German Politics and Culture: 1648–1848
HIEU 154: Modern German History
HIEU 177: Special Topics in Modern German Thought
POLI 120B: The German Political System
POLI 120D: Germany: Before, During, and After Division

Hebrew

ANRG 150: The Rise and Fall of Ancient Israel
ANRG 162: Peoples of the Middle East
HINE 100: The Ancient Near East and Israel
HINE 102: The Jews in Their Homeland in Antiquity
HINE 103: The Jewish Diaspora in Antiquity
HINE 170: Special Topics in Jewish History
HINE 186: Special Topics in Middle Eastern History
POLI 121: Middle East Politics
SOCD 188O: Dilemmas of Israeli Society

Italian

HIEU 122: Politics Italian Renaissance Style
HIEU 124: The City in Italy

Japanese

ECON 163: Japanese Economy
HIEA 110: Japan Through the Twelfth Century
HIEA 111: Japan: Twelfth to Mid-Nineteenth Centuries
HIEA 112: Japan: From the Mid-Nineteenth Century through the U.S. Occupation
HIEA 113: The Fifteen-Year War in Asia and the Pacific
HIEA 114: Postwar Japan
HIEA 115: Social and Cultural History of Twentieth-Century Japan
HIEA 116: Japan-U.S. Relations
HIEA 160: Colloquium on Modern Japanese History
HIEA 161: Representing Japan
POLI 113B: Chinese and Japanese Political Thought (I)
POLI 113C: Chinese and Japanese Political Thought (II)
POLI 132B: Politics and Revolution in China and Japan
POLI 133A: Japanese Politics: A Developmental Perspective
POLI 133E: Public Policy in Japan
SOCD 158J: Religion and Ethics in China and Japan
SOCD 188G: Policemen, Businessmen, and Students: Japanese Organizational Cultures

Russian

HIEU 134: Russia: Ninth Century to 1855
HIEU 156: Russia: 1855 to the Present
HIEU 178: Special Topics in Modern Russian History
POLI 126AB: Politics and Economics in Eastern Europe
POLI 130AA: The Soviet Successor States
POLI 130AD: The Politics of the Russian Revolution
POLI 147A: Soviet Foreign Policy
SOCD 188E Soviet Society

Spanish

ANRG 133: Politics and Modernity: Urban Cultures in Latin America
ANRG 134: The Cultures of Mexico
COM/SF 140C: Comparative Media Systems: Latin America and the Caribbean
COM/CUL 110: Cinema in Latin America
ECON 161: Latin American Economic Development
ETHN 132: Chicano Dramatic Literature
ETHN 133: Hispanic-American Dramatic Literature
ETHN 135A: Early Latino/a-Chicano/a Cultural Production: 1848–1960
ETHN 135B: Contemporary Latino/a-Chicano/a Cultural Production: 1960 to Present
ETHN 136: Topics in Chicano/a-Latino/a Cultures
ETHN 138: Chicano/a and Latino/a Poetry
ETHN 139: Chicano Literature in English

ETHN 145: Spanish Language in the United States
ETHN 180: Topics in Mexican American History
HIEU 138: Imperial Spain, 1476–1808
HIEU 151: Spain since 1808
HIEU 165: Special Topics in Early Modern Spain
HIEU 175: Selected Topics in the History of Nineteenth- and Twentieth-Century Spain
HILA 100: Latin America-Colonial Transformations
HILA 101: Latin America: The Construction of Independence 1810–1898
HILA 102: Latin America in the Twentieth Century
HILA 105: South America: Labor, Coercion, cand Society in the Nineteenth Century
HILA 107: State and Society in Nineteenth- and Twentieth-Century Latin America
HILA 112: Economic and Social History of the Andean Region
HILA 113: Lord and Peasant in Latin America
HILA 114: Social History of Colonial Latin America
HILA 115: The Latin American City, A History
HILA 116: Encounter of Two Worlds: Early Colonial Latin America
HILA 117: Indians, Blacks, and Whites: Family Relations in Latin America
HILA 120: History of Argentina
HLA 122: Cuba: From Colony to Socialist Republic
HILA 131: A History of Mexico
HILA 132: A History of Contemporary Mexico
HILA 160: Topics in Latin American Colonial History, 1500–1820
HILA 161: History of Women in Latin America
HILA 162: Special Topics in Latin American History
HILA 166: Cuba: From Colony to Socialist Republic
LATI 120: Special Topics in Latin American Studies
THHS 109: African Heritage in Contemporary Drama: African, Caribbean, and African-American
THHS 110: Chicano Dramatic Literature
THHS 111: Hispanic-American Dramatic Literature
POLI 134B: Politics in Mexico
POLI 134C: Politics in Mexico
POLI 134D: Selected Topics in Latin American Politics
POLI 134G: Politics in the Andes
POLI 134I: Politics in the Southern Cone of Latin America
POLI 134N: Politics in Central America
POLI 134P: Organizing Women in Latin America
POLI 134Q: Organization, Resistance, and Protest in Latin America
POLI 134R: Political Parties in Latin America
POLI 146A: The U.S. and Latin America: Political and Economic Relations
POLI 146E: U.S.-Latin American Relations: Security Issues
SOCC 151M: Chicanos in American Society
SOCD 188D: Latin America: Society and Politics

Honors Program

The department offers an honors program for outstanding students. Those students who have a 3.75 GPA in linguistics (3.25 overall) at the end of their junior year are eligible to participate. Students interested in participating in the honors program should consult with their department adviser: admission to the program requires nomination by the adviser and approval of the department faculty.

The honors program requires that two graduate linguistics courses be taken as part of the twelve required courses for the major, and further requires one quarter of LIGN 199H. During one of the two graduate courses, the student, in consultation with the instructor and a faculty adviser, will begin a substantial research project which will be continued during the quarter of 199H and will culminate in an honors paper. Responsibility for proposing possible projects and completing necessary paperwork rests with the student. Upon successful completion of the requirements the designation "with distinction," "with high distinction," or "with highest distinction" will appear on the student's diploma.

Independent Study and Directed Group Study in Linguistics for Majors

Upon presentation of a written study proposal or project, and with the consent of the instructor and the adviser, linguistics majors with at least a 3.5 GPA in the major courses may request permission to undertake independent study in linguistics (LIGN 199). No more than one such course (to be taken Pass/Not Pass) may count toward the major.

The Minor Program

The *Linguistics* minor consists of LIGN 101, plus six additional courses in linguistics, at least four of which must be upper-division.

For all courses counted toward the linguistics minor, the student must receive letter grades of C– or better. Courses counted toward the minor may not be taken on a Pass/Not Pass basis, except LIGN 199. Only one quarter of LIGN 199 may be counted toward the minor.

The *Language Studies* minor consists of seven courses, at least five of which must be upper-division:

Literature: One upper-division literature course is required in the language of concentration. This will require proficiency as well as lower-division prerequisites. Therefore, the lower-division courses of the minor may consist of prerequisites for the upper-division literature requirement. American Sign Language students may substitute a non-literature upper-division elective with approval of the faculty adviser.

Linguistics: LIGN 101 is required. In addition students must take either a 'Structure of' course (if available), or one course chosen from LIGN 104, 110, 111, 120, 121, 130, and 150.

Other: Two additional courses that deal with general linguistics, the language of concentration (e.g., literature), or the corresponding culture, subject to approval of the faculty adviser are required.

The Ph.D. Program

The UCSD Ph.D. program in linguistics offers rigorous training in multiple areas of theoretical linguistics, including syntax, semantics, phonetics, phonology, and morphology. The department is particularly strong in the study of interface areas, including syntax/semantics, phonetics/

phonology, and phonology/syntax. Research conducted in a variety of theoretical frameworks is integrated into the graduate curriculum. Students receive a firm foundation in both formal and cognitive/functionalist approaches to syntax and semantics. In phonology, basic training includes segmental and autosegmental phonology, constraint-based phonology, syllable theory, metrical theory, and theories of the phonology-morphology interface. The first two years of graduate study are devoted primarily to gaining a strong background in these core theoretical areas.

This theoretical strength of the department is matched by strength in both language study and experimental science. The range of languages represented in faculty research encompasses American Sign Language (ASL), Bantu, Caucasian, Chinese, Finno-Ugric, Germanic, Persian, Romance, Semitic, Slavic, and Uto-Aztecan. The departmental concern with the empirical facts of language is reflected in a field methods requirement for graduate students as well as in the graduate student language requirement (conversational ability in one language other than English and reading ability in one language other than English). The department has a tradition of working with native speakers of a wide variety of languages. The department's language laboratory maintains a library of written and recorded materials permitting independent study of dozens of languages; it also includes a microcomputer facility for self-instruction in French, German, Italian, and Spanish. The Linguistics Language Program (LLP) provides basic foreign language instruction for the entire campus, and many linguistics graduate students are employed as TAs in the program. Aside from providing a source of funding, the LLP provides graduate students with valuable teaching experience.

The department houses laboratories devoted to experimental studies of language with emphasis on phonetics, event-related brain potentials (ERPs), computational linguistics, and signed languages. The focus of experimental research in the department is the mutual dependence between mechanisms of language processing and theories of phonology and syntax. Linguistics graduate students may supplement their theoretical studies with experimental research; in addition to departmental laboratories, graduate students have access to experimental laboratories concerned with language issues in other departments.

The department has a strong commitment to, and is an active and integral part of, the cognitive science and neuroscience communities at UCSD. Most linguistics faculty have joint appointments in the Department of Linguistics and the Cognitive Science Interdisciplinary Ph.D. Program, and participate in the Department of Cognitive Science graduate core course in language (Cognitive Science 201D) as well as in the all-campus Interdisciplinary Program seminar (Cognitive Science 200) on a regular basis. Graduate students in the Cognitive Science Department frequently participate in Linguistics graduate courses, and Linguistics graduate students regularly attend courses in the Cognitive Science Department on neuroscience, child language acquisition, aphasia, neural networks, and semantics and cognition. Linguistics graduate students are eligible to pursue a joint degree in Cognitive Science and Linguistics within the Interdisciplinary Program. Areas of secondary specialization that are especially well represented in the cognitive science community at UCSD and related institutes include child development, connectionist modelling, distributed cognition, language disorders, neuroscience, philosophy, and psycholinguistics.

The department has access to rich informational resources; in addition to the extensive linguistics holdings in the main library, the department maintains a collection of research reports, dissertations, and unpublished papers. Access to the libraries of other universities exists through interlibrary loan.

Preparation

Since linguistics is a highly technical and analytic field, linguistics students will find their undergraduate training in mathematics and the natural sciences especially valuable. Undergraduate work in certain of the social sciences and humanities, particularly psychology, anthropology, philosophy and literature, is also good preparation for linguistics. The ideal candidate for admission will have both experience with foreign languages and some knowledge of the fundamentals of contemporary linguistic theory. Students who, upon admission, are deficient either in their formal linguistics preparation or languages will be advised by the department on how to make up the deficiency. All graduate students must demonstrate a basic proficiency in phonetics in the first year of graduate study either by passing a basic proficiency test in phonetics upon registration or by taking LIGN 110. New graduate students will be admitted only in the fall of any academic year.

Language Requirements

A candidate for the Ph.D. degree must demonstrate: (1) Conversational ability in *one* language other than English. (2) A reading knowledge of any one language other than his or her native language, subject to faculty approval.

Required Courses

Candidates for the Ph.D. must pass certain graduate courses prior to taking the qualifying examination. All graduate students must take a common core of ten courses. These are:

- Three courses in Syntax and Semantics: 221A, 221B, 230
- Three courses in Phonology and Phonetics: 210, 211A, 211B
- Three courses in Research Methods: 240, 241, 245
- One course in Research Paper Writing: 293

All required courses (except 293) must be taken for a letter grade.

Evaluations

A graduate student is formally evaluated by the entire faculty at particular stages during the first three years of graduate study. The first evaluation (at the end of the third quarter of graduate study) pertains chiefly to performance in courses. The second (or comprehensive) evaluation (at the end of the sixth quarter) determines the student's fitness to continue in the Ph.D. program. It takes into account performance in course work and ability to engage in original research in one area of linguistics as demonstrated in a research paper. The third evaluation (at the end of the ninth quarter) focuses primarily on a second research paper (which must be in a different area of linguistics from the first).

Qualifying Examination

Candidates for the Ph.D. degree must pass an oral qualifying examination which tests the student's knowledge in the area of specialization. Prior to taking this examination, the student must pass the comprehensive evaluation, satisfy all language requirements, successfully complete all required courses, and demonstrate—through

research papers—the ability to carry out independent, dissertation-level research. Students must take the qualifying examination by the end of the fourth year of graduate work.

Colloquium Presentation

Sometime prior to the thesis defense, a student must present a paper orally at a professional gathering. The colloquium requirement is intended to enable a student to develop the skills necessary for organizing research results for oral presentation. The requirement is generally met by presenting a department colloquium or by presenting a paper at a professional meeting. In either case, a faculty member must certify the acceptability of the presentation.

Dissertation

The candidate for the Ph.D. will write a substantial dissertation incorporating the results of original and independent research carried out under the supervision of the doctoral committee. The candidate will be recommended for the doctor of philosophy degree after having made a successful oral defense of the dissertation before the doctoral committee in a public meeting and after having the final version of the dissertation accepted by Geisel Library.

Apprentice Teaching

As part of their preparation for a future academic career, graduate students in linguistics at UCSD are given special opportunities to participate in teaching programs under the supervision of a professor. Depending on qualifications, students may conduct conversation or analysis classes in lower-division language courses, or may assist a professor in the teaching of a graduate or undergraduate linguistics course.

Other Degrees

Candidates for the Ph.D., who have not previously earned a master's degree, may be granted the M.A. in linguistics after: 1) satisfactorily completing twelve required courses; all but LIGN 293 must be taken for a letter grade; 2) passing the comprehensive evaluation at the end of the sixth quarter; and 3) demonstrating a reading knowledge of any language except English, subject to faculty approval.

Candidates for the Ph.D. may also be granted the C. Phil. upon completion of all degree requirements other than the dissertation.

Departmental Ph.D. Time Limit Policies

The time a student takes to complete the Ph.D. depends on a number of factors, including previous preparation and the amount of time spent in teaching or other job commitments. Several policies set an upper limit to the length of the program. All degree requirements other than the dissertation must be completed by the end of the fourth year of graduate work. Total instructional support (TAships, etc.) cannot exceed six years; total university support cannot exceed seven years. Total registered time at UCSD cannot exceed eight years.

COURSES

NOTE: Not all courses are offered every year. It is essential that students consult the linguistics adviser when planning their degree programs.

LINGUISTICS

LOWER DIVISION

3. Language as a Social and Cultural Phenomenon (4)
Introduction to the study of language: language variation, change, and loss; multilingualism, pidginization, and creolization; language planning, standardization, and prescriptivism; writing systems; the role of language in thought, myth, ritual, advertising, politics, and the law.

4. Language as a Cognitive System (4)
Introduction to the study of language: differences between animal communication, sign systems, and human language; origins and evolution of language; neural basis of language; language acquisition in children and adults; fundamental issues in language and cognition.

5. The Linguistics of Invented Languages (4)
Introduction to the study of language through the investigation of invented languages, whether conscious (Elvish, Klingon, Esperanto) or unconscious (creoles, twin/sibling languages). Students will participate in the invention of a language fragment. Topics discussed include language structure, history, culture, and writing systems.

7. Sign Language and Its Culture (4)
Deaf history since the eighteenth century. The structure of American Sign Language and comparison with oral languages. ASL poetry and narrative and Deaf people's system of cultural knowledge. Basic questions concerning the nature of language and its relation to culture.

8. Languages and Cultures in America (4)
Language in American culture and society. Standard and non-standard English in school, media, pop-culture, politics; bilingualism and education; cultural perception of language issues over time; languages and cultures in the 'melting pot', including Native American, Hispanic, African-American, Deaf.

17. Making and Breaking Codes (4)
A rigorous analysis of symbolic systems and their interpretations. Students will learn to encode and decode information using progressively more sophisticated methods; topics covered include ancient and modern phonetic writing systems, hieroglyphics, computer languages, and ciphers (secret codes).

87. Freshman Seminar (1)
The Freshman Seminar Program is designed to provide new students with the opportunity to explore an intellectual topic with a faculty member in a small seminar setting. Freshman seminars are offered in all campus departments and undergraduate colleges, and topics vary from quarter to quarter. Enrollment is limited to fifteen to twenty students, with preference given to entering freshmen.

90. Undergraduate Seminar (1)
A seminar intended for exposing undergraduate students, especially freshman and sophomores, to exciting research programs and conducted by the faculty.

UPPER DIVISION

101. Introduction to the Study of Language (4)
Language is what makes us human, but how does it work? This course focuses on speech sounds and sound patterns, how words are formed, organized into sentences, and understood, how language changes, and how it is learned.

104. Language and Conceptualization (4)
How does language reflect the ways humans conceptualize the world? Issues discussed include the relation between language and thought, how languages differ in conceiving and portraying situations, and how cultural differences are reflected in language structure.

105. Law and Language (4)
The interpretation of language in understanding the law: 1) the language of courtroom interaction (hearsay, jury instructions); 2) written legal language (contracts, ambiguity, legal fictions); 3) language-based issues in the law (First Amendment, libel and slander).

108. Languages of Africa (4)
Africa is home to an astonishing variety of languages. This course investigates the characteristics of the major language families as well as population movements and language contact, and how governments attempt to regulate language use.

110. Phonetics (4)
The study of the sounds which make up human language. How sounds are physically produced; acoustics of speech perception; practical training in translating speech signals into written form and in interpreting computerized speech signals. *Prerequisite: LIGN 101 or consent of instructor.*

111. Phonology I (4)
Why does one language sound different from another? This course analyzes how languages organize sounds into different patterns, how those sounds interact, and how they fit into larger units, such as syllables. Focus on a wide variety of languages and problem-solving. *Prerequisite: LIGN 110.*

119. First and Second Language Learning: From Childhood through Adolescence (4)
(Same as TEP 119) An examination of how human language learning ability develops and changes over the

first two decades of life, including discussion of factors that may affect this ability. *Prerequisite: upper-division standing or consent of instructor.*

120. Morphology (4)
How do some languages express with one word complex meanings that English needs several words to express? Discovery of underlying principles of word formation through problem-solving and analysis of data from a wide variety of languages. *Prerequisite: LIGN 101 or consent of instructor.*

121. Syntax I (4)
What universal principles determine how words combine into phrases and sentences? Introduction to research methods and results. Emphasis on how argumentation in problem-solving can be used in the development of theories of language. *Prerequisite: LIGN 101 or consent of instructor.*

130. Semantics (4)
Introduction to the formal study of meaning. The meanings of words and phrases have an intricate internal structure that is both logical and intuitive. How, precisely, do words mean what they do in isolation and in context? *Prerequisite: LIGN 101 or consent of instructor.*

140. The Structure of American Sign Language (4)
Examination of ASL phonetics, phonology, morphology, syntax, semantics. Including linguistic facial expressions and uses of physical space in verb agreement, aspectual morphology, and classifier constructions. Discussion of discourse, acquisition, psycholinguistics, and historical change. *Prerequisite: LIGN 101; in its absence LISL 1CX or consent of instructor.*

141. Language Structures (4)
Detailed investigation of the structure of one or more languages. May be repeated for credit as topics vary. *Prerequisite: LIGN 101 or consent of instructor.*

143. The Structure of Spanish (4)
Surveys aspects of Spanish phonetics, phonology, morphology, and syntax. Topics include dialect differences between Latin American and Peninsular Spanish (both from a historical and contemporary viewpoint), gender classes, verbal morphology, and clause structure. *Prerequisite: LIGN 101 or consent of instructor.*

144. Discourse Analysis: American Sign Language and Performing Arts (4)
A discourse-centered examination of ASL verbal arts: rhyme, meter, rhythm, handedness, non-manual signals, and spatial mapping; creation of scene and mood; properties of character, dialogue, narration, and voice; cultural tropes; poetic constructions in everyday genres; transcription, body memory and performance. *Prerequisites: LISL 1C/1CX or consent of instructor.*

146. Sociolinguistics in Deaf Communities (4)
An examination of sociolinguistic research on Deaf communities throughout the world, including: sociohistorical contexts for phonological, lexical and syntactic variation, contact between languages, multilingualism, language policies and planning, second language learning, language attitudes, and discourse analysis of specific social contexts. Course will be conducted in ASL. *Prerequisite: LISL 1C/1CX or consent of instructor.*

150. Historical Linguistics (4)
Language is constantly changing. This course investigates the nature of language change, how to determine a language's history, its relationship to other languages, and the search for common ancestors or 'proto-language'. *Prerequisite: LIGN 101 or consent of instructor.*

165. Computational Linguistics (4)
An introduction to the fundamental concepts of computational linguistics, in which we study natural language syntax and semantics from an interpretation perspective, describe methods for programming computer systems to perform such interpretation, and survey applications of computational linguistics technology. Not offered in 2004–2005.

169. Principles of Discourse and Dialog (4)
The principles and mechanisms that underlie the production and interpretation of monologic discourse and conversational dialog. Reference, attention, and dynamic models of discourse state. Discourse coherence and structure. Turn-taking and speech acts in conversation. Computational models. Not offered in 2004–2005.

170. Psycholinguistics (4)
The study of models of language and of language acquisition from the point of view of modern linguistics and psychology. Basic experimental method as applied to language. *Prerequisite: LIGN 101 or consent of instructor.*

171. Child Language Acquisition (4)
A central cognitive, developmental mystery is how children learn their first language. Overview of research in the learning of sound systems, word forms and word meanings, and word combinations. Exploration of the relation between cognitive and language development. *Prerequisite: LIGN 101 or consent of instructor.*

172. Language and the Brain (4)
The mind/body problem, basic neuroanatomy and neurophysiology, cerebral lateralization, origins and evolution of language, aphasia, magnetic resonance imaging (MRI), and event-related potentials (ERPs). *Prerequisite: LIGN 101 or consent of instructor.*

174. Gender and Language in Society (4)
(Same as SOC/B 118A) This course examines how language contributes to the social construction of gender identities, and how gender impacts language use and ideologies. Topics include the ways language and gender interact across the life span (especially childhood and adolescence); within ethnolinguistic minority communities; and across cultures. *Prerequisite: upper-division standing.*

175. Sociolinguistics (4)
The study of language in its social context, with emphasis on the different types of linguistic variation and the principles underlying them. Dialects; registers; sex-based linguistic differences; factors influencing linguistic choice; formal models of variation; variation and change. *Prerequisite: LIGN 101 or consent of instructor.*

176. Language of Politics and Advertising (4)
How can we explain the difference between what is literally said versus what is actually conveyed in the language of law, politics, and advertising? How people's ordinary command of language and their reasoning skills are used to manipulate them.

177. Multilingualism (4)
Official and minority languages, pidgins and Creoles, language planning, bilingual education and literacy, code switching, and langage attrition. *Prerequisite: LIGN 101 or consent of instructor.*

178. Second Language Teaching Methodology (4)
The history of second language teaching methodology, language acquisition theories, current methods, and teaching techniques. *Prerequisite: LIGN 101 or consent of instructor.* Not offered in 2004–2005.

179. Second Language Acquisition Research (4)
Topics in second language acquisition including the critical period, the processing and neural representation of language in bilinguals, theories of second language acquisition and creolization, exceptional language learners, and parallels with first language acquisition. *Prerequisite: LIGN 101 or consent of instructor.*

195. Apprentice Teaching (0-4)
Students lead a class section of a lower-division linguistics course. They also attend a weekly meeting on teaching methods. (This course does not count toward minor or major.) May be repeated for credit, up to a maximum of four units. (P/NP grades only.) *Prerequisites: consent of instructor, advanced standing.*

197. Linguistics Internship (2 or 4)
The student will undertake a program of practical research in a supervised work environment. Topics to be researched may vary, but in each case the course will provide skills for carrying out these studies. *Prerequisite: consent of instructor.*

199. Independent Study in Linguistics (2 or 4)
The student undertakes a program of research or advanced reading in linguistics under the supervision of a faculty member of the Department of Linguistics. (P/NP grades only.) *Prerequisite: consent of instructor.* May be repeated for credit.

199H. Honors Independent Study in Linguistics (4)
The student undertakes a program of research and advanced reading in linguistics under the supervision of a faculty member in the Department of Linguistics. (P/NP grades only.) *Prerequisite: admission to Honors Program.*

GRADUATE

200. Research Forum (2)
A forum for discussion of current issues. (S/U grades only.) May be repeated for credit.

210. Laboratory Phonetics (4)
Readings and laboratory work in acoustic and articulatory phonetics and speech perception. Experimental design and methodology. Phonetic explanation in phonology. Students will gain hands-on experience with laboratory equipment. *Prerequisite: LIGN 110 or equivalent.*

211A. Introductory Phonology (4)
Introduction to the study of the sound patterns of language. Rules and representations, lexical phonology, segmental processes, autosegmental phonology. *Prerequisite: LIGN 110 or consent of instructor.*

211B. Nonlinear Phonology (4)
This course will introduce topics in prosodic phonology and morphology, (including syllable structure, stress, and reduplication). These topics will be investigated within constraint-based phonology. *Prerequisite: LIGN 211A or equivalent.*

215. Topics in Phonology (4)
Descriptive and theoretical problems in phonology. Discussion of work in progress and/or theoretical consequences of alternative analyses. May be repeated for credit when topics vary.

221A. Introduction to Grammatical Theory (4)
This course introduces basic syntactic phenomena and argumentation via the Government and Binding Theory of the 1980s. The phenomena, including NP-Movement, Binding, and Wh-Movement, have been important in the development of Generative Grammar and remain central to current generative frameworks.

221B. Introduction to Grammatical Theory (4)
This course continues to develop Principles and Parameters Theory, as introduced in 221A. It concentrates on A-bar dependencies and the Binding Theory. Focus will be on testing theoretical proposals and understanding the role of theoretical alternatives, underlying assumptions, and the empirical results upon which these theoretical proposals are based.

221C. Introduction to Grammatical Theory (4)
A basic introduction to the theory of Cognitive Grammar, which claims that lexicon, morphology, and syntax form a continuum of symbolic structures. Among the topics examined are semantic structure, grammatical classes, constructions, rules, clause structure, and reference-point phenomena. Not offered in 2004–2005.

222. Theories of Grammar (4)
Introduction to a particular grammatical theory. May be repeated for credit when topics vary.

223. Current Issues in Principles and Parameters Theory (4)
This course examines recent developments in Principles and Parameters Theory. Topics include fundamental work that led to the Minimalist Program and more recent developments in this tradition. May be repeated for credit when topics vary.

224. Lexicalist Theories of Grammar (4)
Introduction to conceptual issues and representational apparatus of lexicalist theories of grammar. Focus on empirical argumentation from numerous languages for lexicalist assumptions. Particular attention to lexical semantics, morphology, and syntax.

225. Topics in Syntax (4)
Descriptive and theoretical problems in syntactic analysis. Theoretical consequences of alternative analyses. May be repeated for credit when topics vary.

230. Formal Semantics (4)
Theories of semantic structure. The relation of meaning to grammar, and how it is to be accommodated in an overall model of linguistic organization. The application of formal semantics to the description of natural language.

235. Topics in Semantics (4)
Advanced material in special areas of the study of meaning and its relation to formal aspects of human language. As subject matter varies, the course may be repeated for credit.

236. Language Universals and Linguistic Typology (4)
Introduction to the typological study of language, contrasting alternative approaches to research in language universals. Main topics covered: cross-linguistic approach to language study (sampling: universal generalizations, hierarchies); explanations for language universals; the role of cross-linguistic analyses in linguistic theory.

237. Functional Linguistics (4)
A sequel to LIGN 221A-C presenting fundamental assumptions of functional linguistics and comparing functionalism with other major theories of syntax. Goals: to expand students' knowledge of theoretical approaches to fundamental grammatical phenomena; to practice constructing arguments based on empirical evidence.

238. Topics in Cognitive Linguistics (0–4)
(Same as Cognitive Science 238) Basic concepts, empirical findings, and recent developments in cognitive and functional linguistics. Language viewed dynamically in relation to conceptualization, discourse, meaning construction, and cognitive processing. As topics vary, may be repeated for credit. Not offered in 2004–2005.

239. Information Structure and Discourse (4)
This course will examine major information-structural categories (topic, focus, etc.) and the relationships between these categories, semantic roles, and grammatical functions. The course will also examine the status of information structure within the architecture of a linguistic theory. *Prerequisite: LIGN 221A, 221B, 221C, 221D, or consent of instructor.*

240. Field Methods (4)
Techniques of discovering the structure of a language through elicitation of data from native speaker consultants. Phonemic, morphemic, and syntactic analysis. *Prerequisite: LIGN 110 or equivalent.*

241. Fieldwork (4)
Fieldwork continuing the research of the previous quarter; student-directed elicitations on topics of interest. *Prerequisite: LIGN 240.*

242. Discourse Interpretation (4)
A graduate course examining discourse interpretation from a computational perspective. Theoretically principled algorithms for resolving pronominal and other types of reference. The interpretation of ellipsis. Methods for recovering the structure of a discourse and determining its coherence.

244. Tense and Aspect (4)
Tense and aspect in natural languages, with an emphasis on the temporal information they predicate over eventualities in discourse. Theories of event structure and their intereaction with tense and aspect. Computational models. Not offered in 2004–2005.

245. Computational Corpus Linguistics (4)
Introduction to computational corpus tools for performing empirically-grounded linguistic investigations. Annotated and unannotated corpora; annotation schemes. Searching using regular expressions. UNIX tools. The PERL programming language. Publically-available language processing systems.

246. Natural Language Processing in LISP (4)
An introduction to the Common LISP programming language in the context of developing computational linguistics technology. Basic computational methods for morphological, syntactic, and semantic processing. Representing lexical and world knowledge. No previous programming experience is assumed.

248. Morphology (4)
Theories of word structure are examined and confronted with data from a variety of languages. Topics may include: the distinction between derivational and inflectional morphology, the morphology/phonology interface, and the morphology/syntax interface. May be repeated for credit as topics vary.

249. Topics in Sign Languages of the Deaf (4)
Topics in the structure of American Sign Language and/or other natural sign languages of Deaf communities. May be repeated for credit when topics vary.

250. Topics in Historical Linguistics (4)
Introduction to the concepts and methodology of historical linguistics. Topics covered include the nature of language change, genetic and areal relationships, the comparative method, and internal reconstruction.

255. Statistics for Linguists (4)
Overview of specific statistical procedures for linguistic analyses of experimental and non-experimental data. Topics covered include: variance, standard deviation, probability, z-scores, t-tests, ANOVA, chi-square, correlation, regression, trend analysis, magnitude estimation, nonparametric tests, post-hoc tests, transformations of data, and displaying data.

260. Formal Linguistics (4)
Much of modern linguistics relies on formal mathematical models for describing structure in natural language. This course surveys some of the main results and techniques with an emphasis on applications in phonology, syntax, semantics, and the information structure of discourse.

270. Psycholinguistics (4)
Issues of natural language processing in relation to one or more of the following levels of linguistic analysis: phonetics, phonology, the lexicon, morphology, syntax, semantics, information structure, or discourse. May be repeated for credit when topics vary.

272. Topics in Neurolinguistics (4)
Issues of language representation and neural instantiation that arise in studies of neural imaging, language disorders, multilingualism and second language acquisition, animal communication, and the origins and evolution of language. May be repeated for credit when topics vary.

278. Research in Second Language Acquisition (4)
This course will investigate topics in second language acquisition including the critical period, the processing and neural representation of language in bilinguals, theories of second language acquisition and creolization, exceptional language learners, and parallels with first language acquisition.

293. Research Practicum (0-4)
Gathering and interpreting data, formulating research questions and hypotheses, making the predictions of hypotheses explicit, finding relevant evidence, and organizing research results into suitable form for presentation in abstracts, talks, and research papers. (S/U grades only.) May be repeated for credit.

295. Professional Development in Methodology of Language Teaching (0-2)
Skills, techniques, issues, and principles relevant to the methods and pedagogy involved in the teaching and learning of a foreign language and the successful transition to a professional career. Readings, discussions, and demonstrations of techniques. (S/U grades only.) May be repeated for credit. *Prerequisite: permission of instructor.* Not offered in 2004–2005.

296. Directed Research (1-8)
Individual research. May be repeated for credit.

299. Doctoral Research (1-12)
Directed research on dissertation topic for students who have been admitted to candidacy for the Ph.D. degree. May be repeated for credit. *Prerequisite: admission to candidacy.*

501. Culture, Art, and Technology Apprentice Teaching (4)
Consideration and development of pedagogical methods appropriate to undergraduate teaching in the interdisciplinary sixth college core sequence, Culture, Art, and Technology under supervision of Core Program faculty, with assistance of the Core Program director, associate director for the Writing Program, and the associate director of the Thematic Program.

502. Apprentice Teaching of Linguistics (1-4)
The course, designed for graduate students serving as teaching assistants in the department's linguistics courses, includes discussion of teaching theories, techniques, and materials, conduct of discussion sessions, and participation in examinations, under the supervision of the instructor in charge of the course. The student must be serving as a teaching assistant in a LIGN course to receive credit.

503. Apprentice Teaching of American Sign Language (1-4)
The course, designed for graduate students serving as teaching assistants in American Sign Language, includes discussion of teaching theories, techniques and materials, conduct of discussion sessions, and participation in examinations, under the supervision of the instructor in charge of the course. (S/U grades only.) May be repeated for credit.

504. Apprentice Teaching of French (1-4)
The course, designed for graduate students serving as teaching assistants in French, includes discussion of teaching theories, techniques and materials, conduct of discussion sessions, and participation in examinations, under the supervision of the instructor in charge of the course. (S/U grades only.) May be repeated for credit.

505. Apprentice Teaching of German (1-4)
The course, designed for graduate students serving as teaching assistants in German, includes discussion of teaching theories, techniques and materials, conduct of discussion sessions, and participation in examinations, under the supervision of the instructor in charge of the course. (S/U grades only.) May be repeated for credit.

506. Apprentice Teaching of Italian (1-4)
The course, designed for graduate students serving as teaching assistants in Italian, includes discussion of teaching theories, techniques and materials, conduct of discussion sessions, and participation in examinations, under the supervision of the instructor in charge of the course. (S/U grades only.) May be repeated for credit.

507. Apprentice Teaching of Spanish (1-4)
The course, designed for graduate students serving as teaching assistants in Spanish, includes discussion of teaching theories, techniques and materials, conduct of discussion sessions, and participation in examinations, under the supervision of the instructor in charge of the course. (S/U grades only.) May be repeated for credit.

508. Apprentice Teaching of Language/Directed Study (1-4)
The course, designed for graduate students serving as teaching assistants in language directed study, includes discussion of teaching theories, techniques and materials, directing study of various uncommonly taught languages, sessions, and participation in examinations, under the supervision of the instructor in charge of the course. (S/U grades only.) May be repeated for credit.

509. Apprentice Teaching, Head Teaching Assistant (1–4)
This course, designed for a graduate student serving as Head Teaching Assistant in the Linguistics Language Program, includes discussion of teaching methods and materials, and classroom observation, directing study of various uncommonly taught languages, sessions, and participation in examinations, under the supervision of the instructor in charge of the course.

COURSES

LANGUAGE

OFFICE: Linguistics Language Program Office, 2125 McGill Hall, Muir College

Students are placed in foreign language courses based on prior preparation and, for French, German, Italian, and Spanish, on the results of a placement test administered prior to or during orientation. Students who miss the placement exam should contact the Linguistics Language Program Office (McGill 2125) for instructions.

In American Sign Language (ASL), Arabic, French, German, Hindi, Italian, and Spanish, conversation sections (Linguistics 1A-1B-1C-1D) consist of small tutorial meetings with a native speaker, plus reading and assigned laboratory work. Analysis sections (Linguistics 1AX-1BX-1CX-1DX) consist of presentation and practice of grammatical structures, discussion sections, assigned laboratory work, and outside reading. For the above languages, each course in the 1A-1B-1C-1D series must be taken concurrently with the corresponding course in the 1AX-1BX-1CX-1DX series.

The Linguistics Language Program also offers Beginning Portuguese 1A-1B-1C. These courses are designed to teach basic vocabulary and grammatical structures needed for oral and written communication in the language. Courses 1A-1B-1C meet three days a week and do not have corresponding 1AX-1BX-1CX courses.

Heritage Language courses are offered in Arabic, Cantonese, Hindi, Korean, Persian, Tagalog, Vietnamese, and Western Armenian. These courses are designed for students with a background in the language who want to improve their oral and written expression.

Linguistics 11 courses are self-instructional: intended for reading the language for scholarly purposes. They are particularly aimed at graduate students preparing to fulfill French or German reading requirements.

Linguistics 19 courses, offered in more than sixty languages, are designed for self-instructional study at an introductory level. Students may enroll for two or four units of credit. For some languages, depending on the availability of suitable materials, the course may be repeated for credit.

AMERICAN SIGN LANGUAGE

Linguistics/American Sign Language (LISL) 1A. American Sign Language Conversation (2.5)
Small tutorial meetings with a signer of American Sign Language (ASL). Conversational practice organized around common everyday communicative situations. Must be taken with LISL 1AX. *Prerequisite: no prior study of ASL.*

Linguistics/American Sign Language (LISL) 1AX. Analysis of American Sign Language (2.5)
Study of American Sign Language (ASL) and analysis of its syntactic, morphological, and phonological features. Readings and discussions of cultural information. The course is taught entirely in ASL. Must be taken with LISL 1A. *Prerequisite: no prior study of ASL.*

Linguistics/American Sign Language (LISL) 1B. American Sign Language Conversation (2.5)
Small tutorial meetings with a signer of American Sign Language (ASL). Conversational practice organized around common everyday communicative situations. Must be taken with LISL 1BX. *Prerequisites: LISL 1A with a grade of C– or better, or equivalent and LISL 1AX with a grade of D or better, or equivalent.*

Linguistics/American Sign Language (LISL) 1BX. Analysis of American Sign Language (2.5)
Study of American Sign Language (ASL) and analysis of its syntactic, morphological, and phonological features. Readings and discussions of cultural information. The course is taught entirely in ASL. Must be taken with LISL 1B. *Prerequisites: LISL 1A with a grade of C– or better, or equivalent and LISL 1AX with a grade of D or better, or equivalent.*

Linguistics/American Sign Language (LISL) 1C. American Sign Language Conversation (2.5)
Small tutorial meetings with a signer of American Sign Language (ASL). Conversational practice organized around common everyday communicative situations. Must be taken with LISL 1CX. *Prerequisites: LISL 1B with a grade of C– or better, or equivalent and LISL 1BX with a grade of D or better, or equivalent.*

Linguistics/American Sign Language (LISL) 1CX. Analysis of American Sign Language (2.5)
Study of American Sign Language (ASL) and analysis of its syntactic, morphological, and phonological features. Readings and discussions of cultural informa-

tion. The course is taught entirely in ASL. Must be taken with LISL 1C. *Prerequisites: LISL 1B with a grade of C– or better, or equivalent and LISL 1BX with a grade of D or better, or equivalent.*

Linguistics/American Sign Language (LISL) 1D. American Sign Language Conversation (2.5)
Small conversation sections taught entirely in American Sign Language. Emphasis on developing signing fluency and greater cultural awareness. Practice of the principal language functions needed for successful communication. Must be taken in conjunction with LISL 1DX. **Successful completion of LISL 1D and LISL 1DX satisfies the requirement for language proficiency in Eleanor Roosevelt and Revelle Colleges.** *Prerequisites: LISL 1C with a grade of C– or better, or equivalent and LISL 1CX with a grade of D or better, or equivalent.*

Linguistics/American Sign Language (LISL) 1DX. Analysis of American Sign Language (2.5)
Practice of the grammatical functions indispensable for comprehensible communication in the language. The course is taught entirely in American Sign Language. Must be taken in conjunction with LISL 1D. **Successful completion of LISL 1D and LISL 1DX satisfies the requirement for language proficiency in Eleanor Roosevelt and Revelle Colleges.** *Prerequisites: LISL 1C with a grade of C– or better, or equivalent and LISL 1CX with a grade of D or better, or equivalent.*

Linguistics/American Sign Language (LISL) 1E. Intermediate American Sign Language Conversation (4)
Course aims to improve language skills through discussion of topics relevant to the Deaf community. Central topics will include education and American Sign Language (ASL) literature. Conducted entirely in American Sign Language. *Prerequisites: LISL 1D and LISL 1DX with a grade of C– or better, or equivalent.*

ARABIC

Linguistics/Arabic (LIAB) 1A. Arabic Conversation (2.5)
Small conversation sections taught entirely in the target language. Emphasis on listening comprehension, speaking, vocabulary building, reading, and culture. Must be taken in conjunction with LIAB 1AX. *Prerequisite: no prior study of Arabic.*

Linguistics/Arabic (LIAB) 1AX. Analysis of Arabic (2.5)
Presentation and practice of the basic grammatical structures needed for oral and written communication and for reading. This course is taught entirely in Arabic. Must be taken in conjunction with LIAB 1A. *Prerequisite: no prior study of Arabic.*

Linguistics/Arabic (LIAB) 1B. Arabic Conversation (2.5)
Small conversation sections taught entirely in the target language. Emphasis on listening comprehension, speaking, vocabulary building, reading, and culture. Must be taken in conjunction with LIAB 1BX. *Prerequisite: LIAB 1A with a grade of C– or better, or equivalent and LIAB 1AX with a grade of D or better, or equivalent.*

Linguistics/Arabic (LIAB) 1BX. Analysis of Arabic (2.5)
Presentation and practice of the basic grammatical structures needed for oral and written communication and for reading. This course is taught entirely in Arabic. Must be taken in conjunction with LIAB 1B. *Prerequisite: LIAB 1A with a grade of C– or better, or equivalent and LIAB 1AX with a grade of D or better, or equivalent.*

Linguistics/Arabic (LIAB) 1C. Arabic Conversation (2.5)
Small conversation sections taught entirely in the target language. Emphasis on listening comprehension, speaking, vocabulary building, reading, and culture. Must be taken in conjunction with LIAB 1CX. *Prerequisite: LIAB 1B with a grade of C– or better, or equivalent and LIAB 1BX with a grade of D or better, or equivalent.*

Linguistics/Arabic (LIAB) 1CX. Analysis of Arabic (2.5)
Presentation and practice of the basic grammatical structures needed for oral and written communication and for reading. This course is taught entirely in Arabic. Must be taken in conjunction with LIAB 1C. *Prerequisite: LIAB 1B with a grade of C– or better, or equivalent and LIAB 1BX with a grade of D or better, or equivalent.*

Linguistics/Arabic (LIAB) 1D. Arabic Conversation (2.5)
Small conversation sections taught entirely in the target language. Emphasis on listening comprehension, speaking, vocabulary building, reading, and culture. Must be taken in conjunction with LIAB 1DX. *Prerequisite: LIAB 1C with a grade of C– or better, or equivalent and LIAB 1CX with a grade of D or better, or equivalent.*

Linguistics/Arabic (LIAB) 1DX. Analysis of Arabic (2.5)
Presentation and practice of the basic grammatical structures needed for oral and written communication and for reading. This course is taught entirely in Arabic. Must be taken in conjunction with LIAB 1D. *Prerequisite: LIAB 1C with a grade of C– or better, or equivalent and LIAB 1CX with a grade of D or better, or equivalent.*

CHINESE

See: **Chinese Studies**

See also: **Linguistics Directed Study**

FRENCH

Linguistics/French (LIFR) 1A. French Conversation (2.5)
Small conversation sections taught entirely in the target language. Emphasis on listening comprehension, speaking, vocabulary building, reading, and culture. Must be taken in conjunction with LIFR 1AX. *Prerequisite: no prior study of French.*

Linguistics/French (LIFR) 1AX. Analysis of French (2.5)
Presentation and practice of the basic grammatical structures needed for oral and written communication and for reading. The course is taught entirely in French. Must be taken in conjunction with LIFR 1A. *Prerequisite: no prior study of French.*

Linguistics/French (LIFR) 1B. French Conversation (2.5)
Small conversation sections taught entirely in the target language. Emphasis on listening comprehension, speaking, vocabulary building, reading, and culture. Must be taken in conjunction with LIFR 1BX. *Prerequisites: LIFR 1A with a grade of C– or better, or equivalent and LIFR 1AX with a grade of D or better, or equivalent.*

Linguistics/French (LIFR) 1BX. Analysis of French (2.5)
Presentation and practice of the basic grammatical structures needed for oral and written communication and for reading. The course is taught entirely in French. Must be taken in conjunction with LIFR 1B. *Prerequisites: LIFR 1A with a grade of C– or better, or equivalent and LIFR 1AX with a grade of D or better, or equivalent.*

Linguistics/French (LIFR) 1C. French Conversation (2.5)
Small conversation sections taught entirely in the target language. Emphasis on listening comprehension, speaking, vocabulary building, reading, and culture. Must be taken in conjunction with LIFR 1CX. *Prerequisites: LIFR 1B with a grade of C– or better, or equivalent and LIFR 1BX with a grade of D or better, or equivalent.*

Linguistics/French (LIFR) 1CX. Analysis of French (2.5)
Presentation and practice of the basic grammatical structures needed for oral and written communication and for reading. The course is taught entirely in French. Must be taken in conjunction with LIFR 1C. *Prerequisites: LIFR 1B with a grade of C– or better, or equivalent and LIFR 1BX with a grade of D or better, or equivalent.*

Linguistics/French (LIFR) 1D. French Conversation (2.5)
Small conversation sections taught entirely in French. Emphasis on speaking, reading, writing, and culture. Practice of the language functions needed for successful communication. Must be taken in conjunction with LIFR 1DX. **Successful completion of LIFR 1D and LIFR 1DX satisfies the requirement for language proficiency in Eleanor Roosevelt and Revelle Colleges.** *Prerequisites: LIFR 1C with a grade of C– or better, or equivalent and LIFR 1CX with a grade of D or better, or equivalent.*

Linguistics/French (LIFR) 1DX. Analysis of French (2.5)
Practice of the grammatical functions indispensable for comprehensible communication in the language. The course is taught entirely in French. Must be taken in conjunction with LIFR 1D. **Successful completion of *LIFR 1D and LIFR 1DX satisfies the requirement for language proficiency in Eleanor Roosevelt and Revelle Colleges.*** *Prerequisites: LIFR 1C with a grade of C– or better, or equivalent and LIFR 1CX with a grade of D or better, or equivalent.*

Linguistics/French (LIFR) 11. Elementary French Reading (2-4)
A self-instructional program designed to prepare graduate students to meet reading requirements in French. After a one-week introduction to French orthography/sound correspondence, students work with a self-instructional textbook. Mid-term and final examinations. (F,W,S)

See also: **Department of Literature**

GERMAN

Linguistics/German (LIGM) 1A. German Conversation (2.5)
Small conversation sections taught entirely in the target language. Emphasis on listening comprehension, speaking, vocabulary building, reading, and culture. Must be taken in conjunction with LIGM 1AX. *Prerequisite: no prior study of German.*

Linguistics/German (LIGM) 1AX. Analysis of German (2.5)
Presentation and practice of the basic grammatical structures needed for oral and written communication and for reading. The course is taught entirely in German. Must be taken with LIGM 1A. *Prerequisite: no prior study of German.*

Linguistics/German (LIGM) 1B. German Conversation (2.5)
Small conversation sections taught entirely in the target language. Emphasis on listening comprehension,

speaking, vocabulary building, reading, and culture. Must be taken in conjunction with LIGM 1BX. *Prerequisites: LIGM 1A with a grade of C– or better, or equivalent and LIGM 1AX with a grade of D or better, or equivalent.*

Linguistics/German (LIGM) 1BX. Analysis of German (2.5)
Presentation and practice of the basic grammatical structures needed for oral and written communication and for reading. The course is taught entirely in German. Must be taken with LIGM 1B. *Prerequisites: LIGM 1A with a grade of C– or better, or equivalent and LIGM 1AX with a grade of D or better, or equivalent.*

Linguistics/German (LIGM) 1C. German Conversation (2.5)
Small conversation sections taught entirely in the target language. Emphasis on listening comprehension, speaking, vocabulary building, reading, and culture. Must be taken in conjunction with LIGM 1CX. *Prerequisites: LIGM 1B with a grade of C– or better, or equivalent and LIGM 1BX with a grade of D or better, or equivalent.*

Linguistics/German (LIGM) 1CX. Analysis of German (2.5)
Presentation and practice of the basic grammatical structures needed for oral and written communication and for reading. The course is taught entirely in German. Must be taken with LIGM 1C. *Prerequisites: LIGM 1B with a grade of C– or better, or equivalent and LIGM 1BX with a grade of D or better, or equivalent.*

Linguistics/German (LIGM) 1D. German Conversation (2.5)
Small conversation sections taught entirely in German. Emphasis on speaking, reading, writing, and culture. Practice of the language functions needed for successful communication. Must be taken in conjunction with LIGM 1DX. **Successful completion of LIGM 1D and LIGM 1DX satisfies the requirement for language proficiency in Eleanor Roosevelt and Revelle Colleges.** *Prerequisites: LIGM 1C with a grade of C– or better, or equivalent and LIGM 1CX with a grade of D or better, or equivalent.*

Linguistics/German (LIGM) 1DX. Analysis of German (2.5)
Practice of the grammatical functions indispensable for comprehensible communication in the language. The course is taught entirely in German. Must be taken in conjunction with LIGM 1D. **Successful completion of LIGM 1D and LIGM 1DX satisfies the requirement for language proficiency in Eleanor Roosevelt and Revelle Colleges.** *Prerequisites: LIGM 1C with a grade of C– or better, or equivalent and LIGM 1CX with a grade of D or better, or equivalent.*

Linguistics/German (LIGM) 11. Elementary German Reading (2-4)
A self-instructional program designed to prepare graduate students to meet reading requirements in German. After a one-week introduction to German orthography/sound correspondences, students work with a self-instructional textbook. Mid-term and final examinations. (F,W,S)

See also: **Department of Literature**

GREEK

See: **Department of Literature**

See also: **Linguistics Directed Study**

HEBREW

See: **Judaic Studies**

See also: **Linguistics Directed Study**

HERITAGE LANGUAGES

Linguistics/Heritage Languages: Tagalog (LIHL) 112. (4)
Designed for students with a background in Tagalog seeking to improve their oral and written expression. Emphasis is on language functions needed for successful oral communication, basic grammatical structures, reading, writing, and culture. The readings will include current newspapers and fiction. Students need to learn different aspects of grammar, variation in the vocabulary, speech etiquette, and use of different language styles. *Prerequisite: Some speaking ability in Tagalog or consent of instructor.*

Linguistics/Heritage Languages: Western Armenian (LIHL) 113. (4)
Designed for students with a background in Western Armenian seeking to improve their oral and written expression. Emphasis is on language functions needed for successful oral communication basic grammatical structures, reading, writing, and culture. *Prerequisite: Some speaking ability in Armenian or consent of instructor.*

Linguistics/Vietnamese for Vietnamese Speakers (LIHL) 114. (4)
Designed for students who grew up speaking Vietnamese and English seeking to improve their skills in Vietnamese. Emphasis on language functions needed for successful oral communication, grammatical structures, reading, writing, politics, culture. Instruction in aspects of grammar, variation in the vocabulary, speech etiquette, use of different language styles. *Prerequisite: some speaking in Vietnamese or consent of instructor.*

Linguistics/Korean for Korean Speakers (LIHL) 115. (4)
Designed for students who grew up speaking Korean and English seeking to improve their skills in Korean. Emphasis on language functions needed for successful oral communication, grammatical structures, reading, writing, politics, culture. Instruction in aspects of grammar, variation in the vocabulary, speech etiquette, use of different language styles. *Prerequisite: some speaking in Korean or consent of instructor.*

Linguistics/Arabic for Arabic Speakers (LIHL) 116. (4)
Designed for students who grew up speaking Arabic and English seeking to improve their skills in Arabic. Emphasis on language functions needed for successful oral communication, grammatical structures, reading, writing, politics, culture. Instruction in aspects of grammar, variation in the vocabulary, speech etiquette, use of different language styles. *Prerequisite: some speaking in Arabic or consent of instructor.*

Linguistics/Persian for Persian Speakers (LIHL) 117. (4)
Designed for students who grew up speaking Persian and English seeking to improve their skills in Persian. Emphasis on language functions needed for successful oral communication, grammatical structures, reading, writing, politics, culture. Instruction in aspects of grammar, variation in the vocabulary, speech etiquette, use of different language styles. *Prerequisite: some speaking in Persian or consent of instructor.*

Linguistics/Cantonese for Cantonese Speakers (LIHL) 118. (4)
Designed for students who have had prior exposure to Cantonese seeking to improve their skills. Emphasis on language functions needed for successful communication. Instruction in aspects of grammar, variation in vocabulary, speech etiquette, different language styles. *Prerequisite: some speaking ability in Cantonese or consent of instructor.*

Linguistics/Hindi for Hindi Speakers (LIHL) 119. (4)
Designed for students who have had prior exposure to Hindi seeking to improve their skills. Emphasis on language functions needed for successful communication. Instruction in aspects of grammar, variation in vocabulary, speech etiquette, different language styles. *Prerequisite: some speaking ability in Hindi or consent of instructor.*

HINDI

Linguistics/Hindi (LIHI) 1A. Hindi Conversation (2.5)
Small conversation sections taught entirely in the target language. Emphasis on listening comprehension, speaking, vocabulary building, reading, and culture. Must be taken in conjunction with LIHI 1AX. *Prerequisite: no prior study of Hindi.*

Linguistics/Hindi (LIHI) 1AX. Analysis of Hindi (2.5)
Presentation and practice of the basic grammatical structures needed for oral and written communication and for reading. This course is taught entirely in Hindi. Must be taken in conjunction with LIHI 1A. *Prerequisite: no prior study of Hindi.*

Linguistics/Hindi (LIHI) 1B. Hindi Conversation (2.5)
Small conversation sections taught entirely in the target language. Emphasis on listening comprehension, speaking, vocabulary building, reading, and culture. Must be taken in conjunction with LIHI 1BX. *Prerequisite: LIHI 1A with a grade of C– or better, or equivalent and LIHI 1AX with a grade of D or better, or equivalent.*

Linguistics/Hindi (LIHI) 1BX. Analysis of Hindi (2.5)
Presentation and practice of the basic grammatical structures needed for oral and written communication and for reading. This course is taught entirely in Hindi. Must be taken in conjunction with LIHI 1B. *Prerequisite: LIHI 1A with a grade of C– or better, or equivalent and LIHI 1AX with a grade of D or better, or equivalent.*

Linguistics/Hindi (LIHI) 1C. Hindi Conversation (2.5)
Small conversation sections taught entirely in the target language. Emphasis on listening comprehension, speaking, vocabulary building, reading, and culture. Must be taken in conjunction with LIHI 1CX. *Prerequisite: LIHI 1B with a grade of C– or better, or equivalent and LIHI 1BX with a grade of D or better, or equivalent.*

Linguistics/Hindi (LIHI) 1CX. Analysis of Hindi (2.5)
Presentation and practice of the basic grammatical structures needed for oral and written communication and for reading. This course is taught entirely in Hindi. Must be taken in conjunction with LIHI 1C. *Prerequisite: LIHI 1B with a grade of C– or better, or equivalent and LIHI 1BX with a grade of D or better, or equivalent.*

Linguistics/Hindi (LIHI) 1D. Hindi Conversation (2.5)
Small conversation sections taught entirely in the target language. Emphasis on listening comprehension, speaking, vocabulary building, reading, and culture. Must be taken in conjunction with LIHI 1DX. *Prerequisite: LIHI 1C with a grade of C– or better, or equivalent and LIHI 1CX with a grade of D or better, or equivalent.*

Linguistics/Hindi (LIHI) 1DX. Analysis of Hindi (2.5)
Presentation and practice of the basic grammatical structures needed for oral and written communication and for reading. This course is taught entirely in Hindi. Must be taken in conjunction with LIHI 1D. *Prerequisite: LIHI 1C with a grade of C– or better, or equivalent and LIHI 1CX with a grade of D or better, or equivalent.*

ITALIAN

Linguistics/Italian (LIIT) 1A. Italian Conversation (2.5)
Small conversation sections taught entirely in the target language. Emphasis on listening comprehension, speaking, vocabulary building, reading, and culture. Must be taken in conjunction with LIIT 1AX. *Prerequisite: no prior study of Italian.*

Linguistics/Italian (LIIT) 1AX. Analysis of Italian (2.5)
Presentation and practice of the basic grammatical structures needed for oral and written communication and for reading. The course is taught entirely in Italian. Must be taken with LIIT 1A. *Prerequisite: no prior study of Italian.*

Linguistics/Italian (LIIT) 1B. Italian Conversation (2.5)
Small conversation sections taught entirely in the target language. Emphasis on listening comprehension, speaking, vocabulary building, reading, and culture. Must be taken in conjunction with LIIT 1BX. *Prerequisites: LIIT 1A with a grade of C– or better, or equivalent and LIIT 1AX with a grade of D or better, or equivalent.*

Linguistics/Italian (LIIT) 1BX. Analysis of Italian (2.5)
Presentation and practice of the basic grammatical structures needed for oral and written communication and for reading. The course is taught entirely in Italian. Must be taken with LIIT 1B. *Prerequisites: LIIT 1A with a grade of C– or better, or equivalent and LIIT 1AX with a grade of D or better, or equivalent.*

Linguistics/Italian (LIIT) 1C. Italian Conversation (2.5)
Small conversation sections taught entirely in the target language. Emphasis on listening comprehension, speaking, vocabulary building, reading, and culture. Must be taken in conjunction with LIIT 1CX. *Prerequisites: LIIT 1B with a grade of C– or better, or equivalent and LIIT 1BX with a grade of D or better, or equivalent.*

Linguistics/Italian (LIIT) 1CX. Analysis of Italian (2.5)
Presentation and practice of the basic grammatical structures needed for oral and written communication and for reading. The course is taught entirely in Italian. Must be taken with LIIT 1C. *Prerequisites: LIIT 1B with a grade of C– or better, or equivalent and LIIT 1BX with a grade of D or better, or equivalent.*

See also: **Department of Literature**

JAPANESE

See: **Japanese Studies**

See also: **Linguistics Directed Study**

LATIN

See: **Department of Literature**

PORTUGUESE

Linguistics/Portuguese (LIPO) 1A. Beginning Portuguese (4)
Presentation and practice of the basic vocabulary and grammatical structures needed for oral and written communication and reading. Emphasis on listening comprehension, speaking, vocabulary-building, grammar, reading, and culture. The course is taught entirely in Portuguese. *No prior study of Portuguese required.*

Linguistics/Portuguese (LIPO) 1B. Beginning Portuguese (4)
Presentation and practice of the basic vocabulary and grammatical structures needed for oral and written communication and reading. Emphasis on listening comprehension, speaking, vocabulary-building, grammar, reading, and culture. The course is taught entirely in Portuguese. *Prerequisite: LIPO 1A with a grade of C– or better.*

Linguistics/Portuguese (LIPO) 1C. Beginning Portuguese (4)
Presentation and practice of the basic vocabulary and grammatical structures needed for oral and written communication and reading. Emphasis on listening comprehension, speaking, vocabulary-building, grammar, reading, and culture. The course is taught entirely in Portuguese. *Prerequisite: LIAB 1B with a grade of C– or better.*

RUSSIAN

See: **Department of Literature**

See also: **Linguistics Directed Study**

SPANISH

Linguistics/Spanish (LISP) 1A. Spanish Conversation (2.5)
Small conversation sections taught entirely in the target language. Emphasis on listening comprehension, speaking, vocabulary building, reading, and culture. Must be taken in conjunction with LISP 1AX. *Prerequisite: no prior study of Spanish.*

Linguistics/Spanish (LISP) 1AX. Analysis of Spanish (2.5)
Presentation and practice of the basic grammatical structures needed for oral and written communication and for reading. The course is taught entirely in Spanish. Must be taken with LISP 1A. *Prerequisite: no prior study of Spanish.*

Linguistics/Spanish (LISP) 1B. Spanish Conversation (2.5)
Small conversation sections taught entirely in the target language. Emphasis on listening comprehension, speaking, vocabulary building, reading, and culture. Must be taken in conjunction with LISP 1BX. *Prerequisites: LISP 1A with a grade of C– or better, or equivalent and LISP 1AX with a grade of D or better, or equivalent.*

Linguistics/Spanish (LISP) 1BX. Analysis of Spanish (2.5)
Presentation and practice of the basic grammatical structures needed for oral and written communication and for reading. The course is taught entirely in Spanish. Must be taken with LISP 1B. *Prerequisites: LISP 1A with a grade of C– or better, or equivalent and LISP 1AX with a grade of D or better, or equivalent.*

Linguistics/Spanish (LISP) 1C. Spanish Conversation (2.5)
Small conversation sections taught entirely in the target language. Emphasis on listening comprehension, speaking, vocabulary building, reading, and culture. Must be taken in conjunction with LISP 1CX. *Prerequisites: LISP 1B with a grade of C– or better, or equivalent and LISP 1BX with a grade of D or better, or equivalent.*

Linguistics/Spanish (LISP) 1CX. Analysis of Spanish (2.5)
Presentation and practice of the basic grammatical structures needed for oral and written communication and for reading. The course is taught entirely in Spanish. Must be taken with LISP 1C. *Prerequisites: LISP 1B with a grade of C– or better, or equivalent and LISP 1BX with a grade of D or better, or equivalent.*

Linguistics/Spanish (LISP) 1D. Spanish Conversation (2.5)
Small conversation sections taught entirely in Spanish. Emphasis on speaking, reading, writing, and culture. Practice of the language functions needed for successful communication. Must be taken in conjunction with LISP 1DX. **Successful completion of LISP 1D and LISP 1DX satisfies the requirement for language proficiency in Eleanor Roosevelt and Revelle Colleges.** *Prerequisites: LISP 1C with a grade of C– or better, or equivalent and LISP 1CX with a grade of D or better, or equivalent.*

Linguistics/Spanish (LISP) 1DX. Analysis of Spanish (2.5)
Practice of the grammatical functions indispensable for comprehensible communication in the language. The course is taught entirely in Spanish. Must be taken in conjunction with LISP 1D. **Successful completion of LISP 1D and LISP 1DX satisfies the requirement for language proficiency in Eleanor Roosevelt and Revelle Colleges.** *Prerequisites: LISP 1C with a grade of C– or better, or equivalent and LISP 1CX with a grade of D or better, or equivalent.*

Linguistics/Spanish (LISP) 15, 16, 17. Intermediate Spanish for the Social Sciences (2)
Conducted entirely in Spanish. Course aims to improve oral language skills through discussions of social science topics, with emphasis on political events and current affairs. Course materials encompass televised news broadcasts, newspapers and periodicals. LISP 15 is offered fall quarter only, LISP 16 is offered winter quarter only, and LISP 17 is offered spring quarter only. Each course may be taken one time and need not be taken in sequence. *Prerequisite: LISP 1D/DX or at least three semesters/four quarters of college Spanish or by permission of the instructor.*

See also: **Department of Literature**

DIRECTED STUDY

Linguistics (LIDS) 19. Directed Study–Language (2-4)
Introductory-level study of a language in the language laboratory on a self-instructional basis. Depending on the availability of appropriate study materials, the course may be taken in blocks of two or four units of credit and may be repeated up to the total number of units available for that language.

Albanian
American Sign Language
Amharic
Arabic, Eastern
Arabic, Egyptian
Arabic, Iraqi
Arabic, Moroccan
Arabic, Saudi
Armenian, Eastern
Bengali
Bulgarian
Burmese
Cambodian
Catalan
Chinese, Cantonese
Chinese, Mandarin
Chinyanja
Cree
Czech
Danish
Dutch

Esperanto
Finnish
French
Fula
German
Greek, Modern
Haitian Creole
Hausa
Hawaiian
Hebrew, Modern
Hindi-Urdu
Hungarian
Igbo
Indonesian
Italian
Japanese
Kannada
Kituba
Korean
Latvian
Lithuanian
Malay
Mongolian
Navajo
New Guinea Pidgin
Norwegian
Persian
Polish
Portuguese
Romanian
Russian
Serbo-Croatian
Slovenian
Spanish
Swahili
Swedish
Tagalog
Telugu
Thai
Tibetan
Turkish
Twi
Vietnamese
Welsh
Yoruba

Literature

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Professors

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Linda Brodkey, Ph.D., *Writing; Director, Warren College Writing Program*
Steven Cassedy, Ph.D., *Slavic and Comparative Literature*
Alain J.-J. Cohen, Ph.D., *Comparative Literature and Film Studies*
Jaime Concha, Ph.D., *Spanish and Latin American Literature*
Stephen D. Cox, Ph.D., *English Literature; Director, Revelle Humanities Writing Program; Academic Senate Distinguished Teaching Award*
R. Michael Davidson, Ph.D., *American Literature, Writing*
Arthur Droge, Ph.D., *New Testament and Early Christian Literature; Director, Program for the Study of Religion*
Page duBois, Ph.D., *Classics and Comparative Literature*
Anthony Edwards, Ph.D., *Classics and Comparative Literature*
Richard Elliott Friedman, Th.D., *Hebrew and Comparative Literature; Katzin Professor of Jewish Civilization*
Judith M. Halberstam, Ph.D., *English and American Literature*
Marcel Hénaff, Ph.D., *French Literature*
Susan Kirkpatrick, Ph.D., *Spanish and Comparative Literature*
Todd C. Kontje, Ph.D., *German and Comparative Literature, Chair*
Lisa M. Lowe, Ph.D., *Comparative Literature*
Masao Miyoshi, Ph.D., *English, Japanese and Comparative Literature; Hajime Mori Endowed Chair*
Louis Adrian Montrose, Ph.D., *English and American Literature*
Eileen Myles, B.A., *Fiction Writing and Literature*
Marta E. Sánchez, Ph.D., *Latin American and Chicano Literature*
Rosaura A. Sánchez, Ph.D., *Spanish, Latin American, and Chicano Literature*
Donald T. Wesling, Ph.D., *English and American Literature, Writing*
Wai-lim Yip, Ph.D., *Chinese and Comparative Literature*
Yingjin Zhang, Ph.D., *Chinese and Comparative Literature and Film Studies*
Oumelbanine Zhiri, Ph.D., *French Literature*

Associate Professors

Robert Cancel, Ph.D., *African and Comparative Literature*
Rosemary M. George, Ph.D., *English Literature*
Stephanie H. Jed, Ph.D., *Italian and Comparative Literature*
Nicole R. King, Ph.D., *Twentieth-Century African American Literature and Culture*
George Mariscal, Ph.D., *Spanish Literature*
William A. O'Brien, Ph.D., *German and Comparative Literature*
Max Parrà, Ph.D., *Mexican and Latin American Literature*
Fred V. Randel, Ph.D., *English Literature*
Roddey Reid, Ph.D., *French Literature*
Kathryn Shevelow, Ph.D., *English Literature*
Shelley Streeby, Ph.D., *American Literature*
Barbara Tomlinson, Ph.D., *Writing; Director, Muir College Writing Program*
Nicole Tonkovich, Ph.D., *American Literature*
Pasquale Verdicchio, Ph.D., *Italian and Comparative Literature*
Cynthia Walk, Ph.D., *German Literature and Film Studies*
Don Edward Wayne, Ph.D., *English Literature*
Winifred Woodhull, Ph.D., *French Literature*
Lisa Yoneyama, Ph.D., *Japanese Studies and Cultural Studies*

Assistant Professors

John D. Blanco, Ph.D., *Literatures of the Americas*
Richard S. Cohen, Ph.D., *South Asian Literature*
Camille Forbes, Ph.D., *Nineteenth-Century African American Literature and Culture*
Sara E. Johnson, Ph.D., *Comparative Literature*
Milos Kokotovic, Ph.D., *Latin American Literature*
Lisa Lampert, Ph.D., *English and Comparative Medieval Studies*
Jin-Kyung Lee, Ph.D., *Comparative Asian Literature and Culture*
Dylan Sailor, Ph.D., *Classics, Latin Studies*

Professors Emeriti

Carlos Blanco-Aguinaga, Ph.D.
Diego Catalán, Ph.D.
Charles R. Cooper, Ph.D.
Abraham J. Dijkstra, Ph.D.
Margit Frenk, Ph.D.
Fanny Q. Howe
James K. Lyon, Ph.D.
Roy Harvey Pearce, Ph.D.
Jerome D. Rothenberg, M.A.
John L. Stewart, Ph.D.
William S. Tay, Ph.D.
Quincy Troupe
Andrew Wright, Ph.D., F.R.S.L.

Associate Professors Emeriti

Jack Behar, Ph.D.
David K. Crowne, Ph.D.
Thomas K. Dunseath, Ph.D.

Lecturers

Rae Armantrout, M.A., *Writing*
Elizabeth Bredeck, Ph.D., *German Language and Literature*
Charles Chamberlain, Ph.D., *Classical Languages and Literature, Writing*
Adriana deMarchi-Gherini, Ph.D., *Italian Language and Literature*
Leslie Collins Edwards, Ph.D., *Classical Languages and Literature*
Melvyn Freilicher, C.Phil., *Writing*
John Granger, Ph.D., *Writing*

Jeyseon Lee, Ph.D., *Korean Language*
Beatrice Pita, Ph.D., *Spanish Language and Latin American Literature*
Catherine Ploye, Ph.D., *French Language and Literature*
Stephen Potts, Ph.D., *American and Popular Literature*
Rebecca Wells, C.Phil., *Russian Language and Literature*
Eliot Wirshbo, Ph.D., *Classical Languages and Literature*

Visiting Professor

Fredric Jameson, Ph.D.

All literature courses at UCSD are offered by a single Department of Literature. The department brings together writers, teachers, scholars, and students of several different languages and literatures. Here, they are united by the nature of the studies they pursue. This lends a comparative aspect to both undergraduate and graduate programs, which lead to the bachelor of arts, master of arts, the candidate in philosophy, and doctor of philosophy degrees. All students must show knowledge of a foreign literature by doing upper-division or graduate work in that literature in the original language. Courses are offered not only in the literatures themselves but in the theoretical aspects of literature and—often in cooperation with other departments—in the relationship of literary study to other disciplines such as philosophy, visual arts, music, sociology, history, psychology, linguistics, and communication. With special permission, undergraduates may take graduate courses for credit, and graduate students may also take undergraduate courses for credit.

The UCSD Library's Mandeville Department of Special Collections offers the undergraduate and graduate literature student an excellent range of resources, including single-author collections, rare and out-of-print books, tapes, maps, and historical archives. Of special interest are the Southworth Collection of Spanish Civil War materials, the Hill Collection of South Pacific Voyages, the Don Cameron Allen Renaissance collection, and the Archive for New Poetry. Within the latter collection are an extensive series of single-author archives, including the papers of Paul Blackburn, Donald Allen, Lew Welch, Charles Reznikoff, Joanne Kyger, Jerome Rothenberg, and others. The Archive for New Poetry is one of the largest collections of contemporary poetry in the United States. Graduate students also have access, facilitated by travel grants, to all other University of California research collections.

Careers for Literature Majors

A major in literature opens many career possibilities. Education is a primary option, but specializations in literature (English, Spanish, etc.) and writing also serve as excellent preparation for graduate and professional programs. A degree in literature provides a strong background for the LSAT and law school. Medical schools seek out students who are prepared not only in the sciences, but also in the humanities and writing. The business world seeks college-trained English majors, and international corporations actively recruit students with a specialty in French, German, Italian, Russian, or Spanish. Literature majors find careers in advertising, book editing and publishing, journalism, communications, mass media, and other professions where writers and editors are in demand. The knowledge of a second language and culture provides literature majors with a decided career advantage.

Secondary School English Teaching

The literature department offers an excellent preparation for teaching English/ESL in secondary schools. Suggested majors include Literatures of the World (with a TEP focus), Literatures in English, and Literature/Writing. If you are interested in receiving a California teaching credential from UCSD, contact the Teacher Education Program for information about prerequisites and professional preparation requirements. Please consult the TEP and the literature department early in your academic career to plan an appropriate literature curriculum.

The Undergraduate Program

Lower-Division Preparation

Lower-division requirements vary, depending on the literature program in which the student elects to concentrate. However, the department strongly recommends that, as part of the freshman/sophomore course work, students who have chosen or are considering a major in literature begin an appropriate lower-division language sequence in the Department of Linguistics or Literature as preparation for upper-division course work in a foreign language and literature. All literature majors require knowledge of a second language.

Writing Component in Literature Courses

It is the departmental expectation that students in lower-division courses should write a minimum of 2,500 words per course. In upper-division courses the minimum requirement is 4,000 words per course.

The Major in Literature

There are nine majors available to students within the Department of Literature: Literatures in English, French, German, Italian, Russian, Spanish, Literatures of the World, Writing, and the composite major in two literatures. Requirements vary from program to program as described below. Once a student has decided upon a major in literature, he or she is required to meet regularly with an adviser in the Department of Literature. Worksheets defining major requirements are available in the literature undergraduate office to help students organize their course work.

All students majoring in literature must study a secondary literature, that is, a literature written in a language different from that of their primary literature. The range of secondary literatures includes Classical Greek, Hebrew, and Latin, as well as the previously mentioned French, German, Italian, Russian, Spanish, and for those concentrating in a foreign literature, English. Students will satisfy this requirement by taking three courses in the secondary literature, given substantially in the native language. At least one of these courses must be upper-division. Students should see an adviser to confirm the selection of the specific courses that will be taken to satisfy both the lower-division and the upper-division components of the secondary literature requirement.

The lower-division component within the secondary literatures may be satisfied by: French 2B and either 2C or 50; German 2B and 2C; Hebrew 2 and 3 (see "Judaic Studies"); Italian 2B and 50; Greek 2 and 3; Latin 2 and 3; Russian 2B and 2C; two courses from Spanish 50A-50B-50C. For majors other than Literatures in English, two courses from English 27-28-29 and 60, 21-22-23-25-26, and 50 are applicable. (Literatures of the

World and writing courses may not be applied toward the English secondary literature requirement.) **Note**: World Literature courses taught in English do not apply unless there is a foreign-language discussion section and materials are available in the foreign language. World Literature (LTWL) courses whose primary focus is U.S. literature may apply toward secondary literature requirements in Literatures in English.

Upper-division courses in the secondary literature are counted as part of the total number of upper-division courses required for the major. Students are free to choose from any of the regularly scheduled upper-division offerings in their secondary foreign literature. Special Studies courses (198s and 199s) cannot be used to satisfy upper-division secondary literature requirements.

All regularly-scheduled departmental courses taken to satisfy the requirements of the literature major, including courses in the secondary literature, must be taken for a letter grade. No grade below C– is acceptable for a course taken in the major.

At least six of the upper-division courses for the major, including a minimum of four in the primary literature and one in the secondary literature, must be taken at UCSD.

Dual Major in Literature

The dual major in literature permits a student to develop a solid foundation in two literatures while remaining within one department. Because the UCSD Literature Department houses literatures that are divided among different departments at most universities, our dual major allows students to coordinate their studies with a single, closely-knit group of faculty, and to arrange their program without repeating two different sets of major requirements. (For example, since a dual major necessarily combines literatures written in two different languages, it automatically fulfills the foreign-language requirement for the literature major.)

Students pursuing a dual major work closely with a faculty adviser to plan a program of study that meets the following requirements:

1. Students will select two literatures of concentration (Literature 1 and Literature 2)
   a. one of the literatures must be in a language other than English;
   b. both concentrations, however, can be in non-English literatures; thus a student can choose English and French, for example, or Russian and Spanish, French and Italian, German and Latin, Spanish and English, etc., but not Literatures of the World or Literature/Writing.
2. Students will meet all lower-division major requirements for each of the two literatures of concentration. See specific "Primary Concentration" listings above; English, Spanish, and Russian, for example, all have lower-division requirements for the major.
3. Students will take eight upper-division courses in each of the two selected literatures of concentration for a total of sixteen upper-division courses.
   a. These must satisfy the upper-division course requirements for each of the two majors. Thus, for example, if one of the concentrations is English, the student must include courses from each of the five stipulated categories; if one of the concentrations is Spanish, upper-division courses must include LTSP 119AB, 119C, 130A, and 130B.
   b. Beyond the upper-division requirements for each literature of concentration (Literature 1 and Literature 2), students will take a sufficient number of elective courses in each of the two literatures of concentration to make a total of eight upper-division courses in each chosen concentration.

Honors Program

The department offers a special program of advanced study for outstanding undergraduates majoring in literature. Admission to this program ordinarily requires an overall GPA of 3.5 and a literature major GPA of 3.7 at the beginning of the senior year. Students meeting these requirements will be sent, during the latter part of fall quarter, an invitation to participate in the program. Interested students who anticipate that they will not meet the established criteria may petition to participate in the program by submitting a personal statement and three letters of support from members of the literature faculty by the end of the third week of fall quarter. During the winter quarter of their senior year, all honors students together take an honors seminar (LTWL 191), which aims to deepen their understanding of the issues of theory and method implied in the study of literature. This seminar lays the groundwork for an honors thesis, written in spring quarter (LT 196), each under the supervision of a faculty member who specializes in the literature of the student's primary concentration. The Honors Program concludes with an oral examination of each honors candidate by a faculty committee, which is charged with recommending whether departmental honors are warranted and, if so, which degree of honors will appear on the student's transcript and diploma. A student from this program will also be recommended for the Burckhardt Prize, which is awarded at graduation for outstanding achievement in the literature major. The honors seminar and thesis course may be applied toward the primary concentration in the literature major. For Literature/Writing majors, the honors seminar is considered to be equivalent to a writing workshop.

Special Studies

These upper-division independent studies opportunities are intended for advanced students, able to work on their own, and interested in a topic not normally covered by departmental offerings.

Students with upper-division standing, a departmental GPA of at least 3.0, an overall GPA of at least 2.5, and completion of lower-division prerequisites in the subject, are eligible to take Special Studies courses (198s and 199s). Those not satisfying these criteria may, with justification supported by the proposed Special Studies instructor, petition for an exception to the regulation. 198s and 199s require at least 4,000 words of writing or an equivalent project as determined by the instructor. Information and Special Studies Enrollment forms are available in the literature undergraduate office. Enrollment requires departmental approval. These courses may not be used to satisfy upper-division secondary literature requirements for majors or minors.

Study Abroad

Study abroad can significantly enhance a student's major, particularly in ways in which it relates to international issues. Literature students are encouraged to study abroad before their senior year. Students who take Education Abroad Program or Opportunities Abroad Program (EAP/OAP) courses in a country appropriate to their major may use up to five upper-division courses to satisfy major requirements or a total

of three toward a minor. For dual majors in literature, six courses from abroad may apply, with no more than four toward either one of the two concentrations. These must be approved by the department after they have been entered on the student's official record at UCSD. The approval process is described in a hand-out on receiving transfer credit, available in the Literature Undergraduate Office. The main point to remember is that before leaving for study abroad, students should know which EAP courses will count toward the major or minor, and which will not.

Individual Program Requirements

Primary Concentration in Literatures in English

1. Six lower-division courses:
   a. LTEN 21, 22, and 23.
   b. LTEN 25 and 26, plus one of the following: LTEN 27, 28, or 29.

   Even if some or all of these courses are used toward meeting a college's humanities or general-education requirements, they will still count toward satisfying the requirements for the major in literatures in English.
2. Nine upper-division courses from literatures in English offerings, including courses from each of the following three categories:
   a. Two British literature courses, one each from periods before and after 1660.
   b. Two U.S. literature courses, one each from periods before and after 1860.
   c. One course in world Anglophone literature(s) with focus other than British or U.S. literatures.
3. One upper-division course in the history of criticism or in literary/cultural theory and methods from among the following: LTTH 110; LTTH 115; or LTCS 100.
4. Three courses in a secondary literature, at least one of which must be upper-division. (See *"The Major in Literature"*, above.)
5. Upper-division electives chosen from Department of Literature offerings to make a total of twelve upper-division courses.

Primary Concentration in a Foreign Literature

Literatures in French

1. Nine upper-division courses as follows:
   a. LTFR 115-116, Themes in French Intellectual and Literary History
   b. Seven additional upper-division courses in French literature, including at least one course in each of the following periods: seventeenth or eighteenth century; nineteenth century; and twentieth century.
2. Three courses in a secondary literature, that is, a literature written and taught in a language other than French. At least one of these courses must be upper-division. Special studies courses (198s and 199s) and courses in foreign literatures which are taught in French do not apply to the secondary literature requirement.
3. Upper-division electives chosen from Department of Literature offerings to make a total of twelve upper-division courses.

Literatures in German

1. Nine upper-division courses in German literature. Two of these should be in literature written before the year 1850.
2. Three courses in a secondary literature, that is, a literature written and taught in a language other than German. At least one of these courses must be upper-division. Special studies courses (198s and 199s) and courses in foreign literatures taught in German do not apply to the secondary literature requirement. See The Major in Literature, above, for applicable lower-division courses.
3. Upper-division electives chosen from Department of Literature offerings to make a total of twelve upper-division courses.

Literatures in Italian

1. Nine upper-division courses in Italian literature as follows:
   a. LTIT 100, Introduction to Italian Literature
   b. LTIT 115, Medieval Studies
   c. LTIT 161, Advanced Stylistics and Conversation
   d. LTCS 140, Subaltern Studies in Context or LTIT 150, Italian North American Culture
   e. Five additional upper-division courses in Italian literature taught in Italian
2. Three courses in a secondary literature, that is, a literature written and taught in a language other than Italian. At least one of these courses must be upper-division. Special studies courses (198s and 199s) and courses in foreign literatures taught in Italian do not apply to the secondary literature requirement. See The Major in Literature, above, for applicable lower-division courses.
3. Upper-division electives chosen from Department of Literature offerings to make a total of twelve upper-division courses.

Russian Literature

1. Russian 1A-B-C and 2A-B-C or their equivalent
2. Twelve upper-division courses in Russian:
   a. LTRU 104A-B-C
   b. LTRU 110A-B-C
   c. Six additional upper-division courses in Russian literature
3. Three courses in a secondary literature, that is, a literature written and taught in a language other than Russian. At least one of these courses must be upper-division. Special studies courses (198s and 199s) and courses in foreign literatures taught in Russian do not apply to the secondary literature requirement. See The Major in Literature, above, for applicable lower-division courses.

Students in the Russian literature major are encouraged to participate in the Education Abroad Program (EAP) in Moscow and to investigate other options for foreign study through the Opportunities Abroad Program (OAP). By petition, credits earned through EAP/OAP can fulfill UCSD degree and major requirments.

Literatures in Spanish

1. Two lower-division Spanish literature courses, as indicated:
   a. LTSP 50A, Peninsular Literature
   b. Either LTSP 50B or LTSP 50C, Latin American Literature
2. Nine upper-division courses as follows:
   a. LTSP 130A, Development of Spanish Literature
   b. LTSP 130B, Development of Latin American Literature

c. LTSP 119AB or 119C (Cervantes)

d. Six additional upper-division courses in Spanish, Latin American, and/or Chicano literature (taught in Spanish)

3. Three courses in a secondary literature, that is, a literature written and taught in a language other than Spanish. At least one of these courses must be upper-division. Special studies courses (198s and 199s) and courses in foreign literatures taught in Spanish do not apply to the secondary literature requirement. See The Major in Literature, above, for applicable lower-division courses.

4. Upper-division electives from Department of Literature offerings, whether in Spanish or in another literature, to make a total of twelve upper-division courses.

Students majoring in Spanish can choose to concentrate on either Spanish or Latin American literature. All students, however, are encouraged to take courses in the various national literatures as well as in Chicano literature for a broad background in Spanish language literatures.

Students not having a solid linguistic base in Spanish are advised to take intermediate language courses from the LTSP 2 and 50 sequences for additional review of Spanish grammar, development of writing skills, and introduction to literary analysis. Only 50A and either 50B or 50C, however, can count towards the major.

It is strongly recommended that students take LTSP 130A before any other upper-division Spanish (peninsular) literature course and LTSP 130B before any other upper-division Latin American literature course.

Primary Concentration in Literatures of the World

The major in Literatures of the World allows students to expand the focus of their work beyond a single-language literature. They plan an individual program with options in regional studies (Europe, the Americas, East Asia, Africa, Near East) and topical studies (genre, period, gender, ethnic literature, teacher education, literature and the visual arts, cultural studies, literature and science, writing, Third World Studies, The Western Tradition) as well as the single-language literatures.

1. Lower-division (three courses):

A three-course sequence in literature chosen from any section in literature.

Students can combine courses in an original national language/literature with courses in translation to satisfy this requirement, such as LTFR 2A and 2B plus LTWL 4A (Fiction and Film in the 20th Century: France). As of fall 2003, students may use either the Revelle College Humanities sequence (HUM 1–5) or Eleanor Roosevelt College's Making of the Modern World (MMW 1–6) to satisfy the lower-division sequence for the LTWL major or minor.

2. Upper-division (twelve courses):

a. six courses in a regional or single-language literature, to be taken in the original language(s) or in translation

b. four courses focused on a topic or another regional or single-language literature

c. two courses in non-European and non-U.S. literature; if satisfied under group (a) or group (b), any other two literature courses may be substituted.

3. Three courses in a secondary literature, that is, a literature written and taught in a language different from that of the primary literature. At least one of these courses must be upper-division. Upper-division courses taken to satisfy the secondary literature requirement may be counted as part of the twelve upper-division courses for the major and may, where appropriate, be applied to requirements in Group 2 or 3. Students should see an adviser when selecting specific courses that will be taken to satisfy this requirement. Special studies courses (198s and 199s) and courses in foreign literatures taught in translation do not apply to the secondary literature requirement. See The Major in Literature, above, for applicable lower-division courses.

At least two of the required twelve upper-division courses must be in literature written before 1850. No more than four courses in Lit/Writing may be taken as part of the world literatures major, and these will generally apply to Group 2.b.

Courses formerly listed under General Literature were renumbered effective fall 1998 under the following subject headings:

LTAF–African Literatures

LTAM–Literature of the Americas

LTEA–East Asian Literatures

LTEU–European and Eurasian Literatures

LTNE–Near Eastern Literatures

LTWL–World Literatures (courses or sequences which do not belong to a single linguistic or regional grouping)

The Pre-Writing Major

Until they are admitted to the writing major, students may indicate their interest in writing by declaring a pre-writing major using the pre-writing major code (LT01). Admission to the writing major will be determined by evaluation of each student's performance in the LTWR 8A/8B/8C sequence.

Normally, students are expected to achieve a grade of B or better in each of these courses to ensure their eligibility for declaring the major.

Primary Concentration in Writing

The writing major is designed to provide direct experience in writing fiction, nonfiction, and poetry as well as engage the student writer in both the world of "writing culture"—public readings, publication, and the media—and literary theory and practical critique. An indispensable feature of this program is that it engages students with one another's work, both critically and communally. Writing majors will move through a sequence of courses within (and between) genres in order to develop their own style and confidence in the work of writing and critique. Students who are interested in teaching writing will find this major an opportunity both for writing extensively and dealing critically with the act of written composition. Students must complete the sequence LTWR 8A-B-C prior to declaring a major in Literature/Writing. The major requirements are as follows:

1. Any of the following literature sequences:

a. LTWL 4A-B-C-D-E-M–any three courses in the sequence (Fiction and Film in Twentieth-Century Societies)

b. LTWL 19A-B-C (Introduction to the Ancient Greeks and Romans)

c. LTEN 21 and 22, plus one course chosen from LTEN 23, 25, 26, 27, 28, and 29.

d. TWS 21, 22, 23, 24, 25, 26-any three courses (Third World Literatures)

2. Twelve upper-division courses:

a. Six upper-division courses in Lit/Writing from the writing workshop sequence (LTWR 100–129). These workshops may

be repeated for credit (see course listing for number of times workshops may be repeated), but the requirement should show a range of writing experience in at least two major writing types. No other courses may be substituted for this basic requirement of six upper-division workshops.

b. One course from the group numbered Lit/Writing 140-148.

c. Five upper-division electives chosen from Department of Literature offerings.

3. Three courses in a secondary literature, that is, a literature written and taught in a language other than English. At least one of these courses must be upper-division. Students should see an adviser when selecting specific courses that will be taken to satisfy this requirement. Special studies courses (198s and 199s) and courses in foreign literatures which are taught in English translation do not apply to the secondary literature requirement. See The Major in Literature, above, for applicable lower-division courses.

Double Major in Literature/Writing and a Subject outside Literature

Students who wish to major both in Literature/Writing and in a department other than the Department of Literature must fulfill all requirements for the writing major as described above. Students must submit a double major petition for approval by the participating departments and the student's provost office.

Double Major within the Department of Literature in Literature/Writing and Another Literature

Students who wish to major both in literature/writing and in literature (any section) should see the department for information regarding appropriate double major requirements. Generally, all requirements for each major must be completed, though the secondary literature and two upper-division courses, where appropriate, may overlap from one major to the other.

The Minor in Literature

The department offers a wide range of possibilities for noncontiguous minors. The options include courses in a single regional or national literature, courses in more than one literature, and a combination of language and literature courses. In all instances, the minors require six or seven courses depending upon a student's first quarter of attendance at UCSD. *All courses taken to complete a literature minor must be taken for a letter grade.* No grade below C– is acceptable.

Please see the department undergraduate office for specific minor requirements.

For students entering winter quarter 1998 and thereafter, a minor in literature will consist of seven courses as described below.

French, German, Greek, Italian, Latin, Russian, or Spanish Literature: seven courses, at least four of which must be upper-division in the same literature.

Literatures in English, Literatures of the World, and Literature/Writing: seven courses, at least five of which must be upper-division.

Lower-division courses applicable toward minors:

English—LTEN 21, 22, 23, 25, 26, 27, 28, 29, 50, 60
French—LTFR 2A-B-C, 50
German—LTGM 2A-B-C
Greek—LTGK 1, 2, 3
Hebrew—JUDA 1, 2, 3 (see Judaic Studies)
Italian—LTIT 2A-B, 50
Latin—LTLA 1, 2, 3
Russian—LTRU 2A-B-C
Spanish—LTSP 2A-B-C-D, 50A-B-C
Writing—LTWR 8A-B-C

General Minor—For students entering fall 1997 and earlier: six Literature courses, at least three of which must be upper-division: usually 1) a three-course lower-division sequence such as LTEN 21/22/23, LTEN 27/28/29, LTFR 2A/2B/50, LTGN 19A/9B/19C, LTLA 1/2/3, LTSP 2A/2B/2C; and 2) three or more upper-division courses, at least two of which must be in a single national literature, taught either in the original language or in translation. No more than one upper-division course in Literature/Writing may be applied toward the general literature minor. Students should see the general literature faculty adviser or the undergraduate staff when planning a minor or program of concentration in general literature.

Literatures of the World—For students entering Winter 1998 and thereafter: seven literature courses, at least five of which must be upper-division—usually 1) a two- or three-course lower-division sequence and 2) five upper-division courses with a single unifying theme. As of fall 2003, students may use either the Revelle College Humanities sequence (HUM 1–5) or Eleanor Roosevelt College's Making of the Modern World (MMW 1–6) to satisfy the lower-division sequence for the LTWL major or minor.

Writing Minor—Seven courses, at least five of which must be upper-division. The minimum of five upper-division courses must cover at least two major writing genres, with course work chosen from writing courses numbered 100 through 146.

Please see the department for further information and specifics regarding minors in literature.

The Graduate Program

Doctoral Degree Program

The department offers a single Ph.D. in literature with concentrations in any of the fields in which members of the department do research (see below). The C.Phil. (candidate in philosophy) is conferred upon all students who pass the qualifying examination and are advanced to candidacy. Ph.D. Students in the doctoral program may also qualify for the M.A. upon completion of their qualifying examinations.

Preparation

The following are requirements for admission to graduate study in literature:

1. A baccalaureate or a master's degree with a major in one of the literatures offered by the department, or in another field approved by the departmental committee on graduate studies.
2. Satisfactory scores on the Graduate Record Examination achieved within the past three calendar years. The Subject Test is not required.
3. Competence in reading, understanding, and interpreting both literary and critical texts in a second language, and—when appropriate—ability to follow seminar discussions or lectures in a second or third language.

Completed applications and supporting materials must be received by the deadline posted on our Web site: http://literature.ucsd.edu, for admission to the following fall quarter. Those planning to apply should take

the Graduate Record Examination far enough in advance so that the scores will be available to the admissions committee in January.

Course of Study

Formal study begins with a first-year, three-quarter introductory sequence (Literature/Theory 200A-B-C) having an interdisciplinary and theoretical emphasis. During the first three years, the course of study will include at least four seminars in one literature and two in another (students in comparative literature must take at least one seminar or upper-division undergraduate course in a third literature); at least four seminars drawn from offerings in literary theory, the second or a third literature, cultural studies, comparative literature, or composition studies; and five additional seminars open entirely to the student's choice (four for students in comparative literature). Such "open" seminars should generally be related to the intended dissertation field. At most, two seminars in other disciplines may be substituted for any of the latter group, with the adviser's permission. Students must also fulfill a historical breadth requirement by completing two seminars dealing with texts or cultural practices prior to 1800. For students with approved M.A. degrees the initial three-year sequence may be reduced somewhat, depending on the department's criteria for transferring credits and on the students' plans for doctoral study.

Students in comparative literature must take four of the above-described seminars in comparative literature or in other sections, provided that they be clearly comparative in nature. Comparative literature seminars taken for Literature 1, 2, or 3 must be substantially focused upon the relevant language and deal with materials in the original. Students who wish to take these courses in a literature for which seminars are not regularly offered in the Department of Literature may substitute 298s or undergraduate courses enhanced by additional assignments. To do so, however, students must demonstrate through prior course work that they have already attained graduate-level competency in the literature and language in question and they must obtain approval from the comparative literature graduate adviser and the director of Graduate Studies.

In the sixth quarter, students may register for one four-unit independent study course to prepare reading lists for the subject-area qualifying examinations. The third year is spent in taking seminars and in preparing for the qualifying examinations. During this year, students may register for one four-unit independent study course in which they work on the long paper required for the qualifying examinations.

The qualifying examination is usually taken during the ninth quarter of enrollment. It must be completed by the end of the tenth quarter. The fourth and fifth years will be devoted to preparation of the dissertation

Students may write dissertations in any of the fields in which members of the department do research. These fields include English, American, French, German, biblical Hebrew, Italian, Greek, Latin, Spanish, Chinese, Japanese, Russian, Chicano, Asian-American, and African-American literature, comparative literature, literary theory, women's studies, cultural studies, early modern studies, and composition studies.

Specialty in Composition Theory, Research, and Practice

The Department of Literature offers special studies to graduate students who wish to concentrate on composition theory, research, and practice. The composition subspecialty is an interdisciplinary course of study that requires students to work with faculty both in the department and across the university. The department regularly offers graduate seminars taught by faculty in composition, along with a variety of seminars on history, theory, cultural studies, and literatures in English of special interest to students in composition. Students in special studies in composition take two research methods courses outside the department on topics such as field work, historiography, or research design in the human sciences to qualify them to conduct the research for their dissertations. Students are also encouraged to apply to teach in one of the five college undergraduate writing programs on campus, to see for themselves how classroom and administrative practice intersect with theory and research.

Language Requirements

Graduate students in literature are required to develop the ability to read literary and secondary texts and—when appropriate—to follow seminar discussions or lectures in a second language, a language other than the one in which the literature of their intended specialization is written. To satisfy this requirement students must demonstrate language proficiency and completion of two seminars in the literature of the second language. With the approval of the director of Graduate Studies, students may satisfy the language requirement by substituting for a seminar an upper-division undergraduate course enhanced by additional assignments, and which must be completed with the grade of A. This is normally done only when there is no seminar offered in the chosen language. Students must pass an examination in reading, interpretation, and translation in each of the two courses taken to satisfy the second language requirement. The language requirements must be satisfied by the end of the third year of study.

Doctoral students specializing in comparative literature require knowledge in depth of two foreign languages. "Knowledge in depth" means the ability to attend graduate seminars given in the original language (or seminars where the texts are read in the original language). Students must demonstrate this ability by enrolling in such seminars or, where this is not possible, by taking enhanced upper-division courses. If upper-division courses are not available, students may take guided independent study in the language in question.

The M.A. program in comparative literature requires knowledge in depth of one foreign language.

Advancement to Candidacy

No later than the first quarter of the third year, the student should choose a Ph.D. adviser, who will, in consultation with the student, form a qualifying examination committee. The student and the qualifying examination committee will jointly determine the nature of the long research paper, (approximately 30 pages) and the two areas of specialization upon which the student will be examined in writing. After satisfactory completion of the paper and the written examinations, the student will take a two-hour oral doctoral examination. On passing the oral examination, the student is declared eligible for advancement to candidacy for the Ph.D. The C. Phil. degree is conferred on those so advanced. Thereupon, a doctoral dissertation is written. This work is defended in a traditional final examination.

Teaching

The department requires that each Ph.D. student do some apprentice teaching before the

completion of the degree; the minimum amount required is equivalent to the duties expected of a half-time teaching assistant for three academic quarters. This teaching involves conducting, with the guidance and support of a supervising professor, discussion sections and related activities in a variety of freshman and sophomore courses. Academic credit is granted for the training given under the apprentice teaching program.

Grading

The only grading option for literature graduate courses is Satisfactory/Unsatisfactory (S/U). Students receive written evaluations of their performance in seminars. Upper-division undergraduate courses must be taken for a letter grade. Students must receive a grade of A to maintain acceptable graduate status and continuation of funding.

Departmental Ph.D. Time Limit Policies

Students must be advanced to candidacy by the tenth quarter of study. Departmental normative time is five years. Total registered time at UCSD cannot exceed eight years.

Financial Support

Ph.D. students entering the program with a B.A. may be supported (either by employment or fellowships) for five years. Students who have an M.A. and have been given transfer credit may be supported for four years. Such support depends upon the funds available, the number of students eligible, and the rate of progress.

Master's Degree Program

The master's degree program is intended to meet the needs of several groups: (1) persons interested in possibly applying later, at UCSD or elsewhere, for admission to a Ph.D. program and wishing to strengthen their preparation for such a program; (2) persons seeking a master's degree only, for reasons of professional development or cultural enrichment; and (3) graduate students who have been admitted to the Ph.D. program and who decide to qualify also for a master's degree. The M.A. degree is currently available in five fields: literatures in English, French, German, Spanish, and Comparative literature. **Note**: *The department does not offer financial support for M.A. candidates.* It is possible, in cases of full-time employment or other compelling reasons, to apply for permission to enroll on a part-time basis.

Completed applications and supporting materials must be received by the deadline indicated in the department's Web site for admission to the following fall quarter. Those planning to apply should take the Graduate Record Examination far enough in advance so that the scores will be available to the admissions committee in January.

The requirements for the M.A. degree are a total of thirty-six units. Included must be the following:

1. Twenty units of graduate seminars, including Literature/Theory 201, which is normally taken during a student's first quarter in the program.
2. Eight additional units of graduate seminars. Normally, M.A. students should take graduate seminars. If no seminars are available in the student's area of specialization (defined as Literatures in English, Literatures in French, etc.), students may take an enhanced upper-division course in place of a seminar. Students may take ONE guided independent study (298) to fulfill requirements in this category, with the adviser's permission.
3. For the M.A. in Literatures in English, Spanish, French, and German, students will be required to complete a minimum of sixteen units of course work in the specific literature, read in its original language, in which they plan to receive their degree. Students may take enhanced upper-division courses or, in exceptional circumstances, on guided independent study to complete this requirement if no graduate seminars are available in the language in question. For the M.A. in comparative literature students will be required to complete a minimum of twelve units of course work in one literature of concentration. Comparative literature seminars are recommended when their focus is substantially upon the literature in question and they deal with materials in the original language.
4. Language Requirement: Four units of literature in a language other than that of the student's principal concentration. For students in French, German, Spanish and literatures in English, this course may be taken either in the original language or in translation, and it may be used toward fulfilling the requirements listed under items 1 and 2 above. A graduate seminar in English or American literature may be used to fulfill this requirement by students working toward an M.A. degree in French, German, or Spanish. An enhanced upper-division course in Literatures of the World may be taken to satisfy this requirement as long as its principal readings were originally written in a language other than that of their principal concentration. For the M.A. in comparative literature students must take either eight units of seminar work in the second literature (other than the literature of concentration) or four units of seminar work in a second literature and four units of seminar or enhanced upper-division course in a third literature. Texts or other materials must be dealt with in the original languages. Comparative literature seminars are recommended when their focus is substantially upon the literature in question and they deal with materials in the original language.
5. For the M.A. in comparative literature students must take at least one seminar in comparative literature or in another section, if the seminar is clearly comparative in nature. This requirement can be satisfied by a course taken for item 3 or item 4 above. Students wishing to take courses for requirements 3 or 4 above in a literature for which seminars are not regularly offered in the Department of Literature may substitute upper-division undergraduate courses enhanced by additional assignments or, in exceptional cases, may take 298s. To do so, however, students must demonstrate through prior course work that they have already attained graduate-level competency in the literature and language in question and they must obtain approval from the comparative literature graduate adviser. Such 298s and upper-division courses should not exceed a total of two courses within a student's program unless demonstrably necessary.
6. Eight units of guided research 295, culminating in an acceptable master's thesis or master's examination.

The only grading option for literature graduate courses is Satisfactory/Unsatisfactory (S/U).

Students receive written evaluations of their performance. Upper-division undergraduate courses must be taken for a letter grade. Students must receive a grade of A to maintain acceptable graduate status and continuation of funding.

COURSES

Note: A list of specific course offerings (with names of instructors for the following academic year) is available in the undergraduate office of the Department of Literature, LIT 3110. A list of graduate course offerings is available in the graduate office, LIT 3140.

Undergraduate students may enroll in graduate seminars with the consent of instructor and will receive a P/NP grade unless they petition for a letter-grade option within the first four weeks of the quarter in which the course is taken.

CHINESE LITERATURE

UPPER-DIVISION

Prerequisite: upper-division standing or consent of instructor. Additional prerequisites may be specified below.

LTCH 101. Readings in Contemporary Chinese Literature (4)
Intended for students who have the competence to read contemporary Chinese texts, poetry, short stories, and criticism in vernacular Chinese. May be repeated for credit as topics vary.

COMPARATIVE LITERATURE

GRADUATE

LTCO 202C. History of European Criticism and Aesthetics (4)
A core course for comparative literature, strongly recommended for all graduate students in the comparative literature program. A historical survey of criticism and aesthetics divided as follows: 202C, Romanticism to late nineteenth century.

LTCO 210. Classical Studies (4)
Analysis of significant works of the Greek and Roman traditions, with attention to their interest for later European literature. May be repeated for credit as topics vary.

LTCO 212. Studies in the Hebrew Bible (4)
Analysis of books of the Hebrew Bible from literary, historical, archaeological, theological, and psychological perspectives; text-critical and source-critical study of the Hebrew text. Repeatable for credit when topics vary.

LTCO 264. Oral Literature (4)
An introduction, through the study of recordings of actual oral performance as well as of the written record, to research in oral literature and the theoretical and methodological problems entailed. (Not offered 2002–03.)

LTCO 274. Genre Studies (4)
A consideration of a representative selection of works relating to a theme, form, or literary genre. May be repeated for credit as topics vary.

LTCO 231. Literature and Film (4)
A study of literature and film in relation to one another, to critical and aesthetic theories, and to historical context. May be repeated for credit when topics vary. *Prerequisite: graduate standing or consent of instructor.*

LTCO 282. Literature and Philosophy (4)
Questions and problems from the history of philosophy or from the various fields of philosophy (e.g., epistemology, ethics, logic) in their interaction with intellectual issues and questions addressed by literary criticism and theory. Repeatable for credit when topics vary.

LTCO 295. M.A. Thesis (1–8)
Research for the master's thesis. Opened for repeated registration up to eight units. (Satisfactory/Unsatisfactory grades only.) *Prerequisite: enrolled in M.A. program.*

LTCO 296. Research Practicum (1–12)
Research project to be developed by a small group of students under the continued direction of individual faculty members. Primarily a continuation of a previous graduate seminar. The 296 courses do not count toward the seminar requirement. Repeatable for credit.

LTCO 297. Directed Studies: Reading Course (1–12)
This course may be designed according to an individual student's needs when seminar offerings do not cover subjects, genres, or authors of interest. No paper required. The 297 courses do not count toward the seminar requirement. Repeatable for credit.

LTCO 298. Special Projects: Writing Course (1–12)
Similar to a 297, but a paper is required. Papers are usually on subjects not covered by seminar offerings. Up to two 298s may be applied toward the twelve-seminar requirement of the doctoral program. Repeatable for credit.

LTCO 299. Dissertation (1–12)
Research for the dissertation. Offered for repeated registration. Open only to Ph.D. students who have advanced to candidacy.

LITERATURE/CULTURAL STUDIES

LOWER-DIVISION

LTCS 87. Freshman Seminar (1)
The Freshman Seminar Program is designed to provide new students with the opportunity to explore an intellectual topic with a faculty member in a small seminar setting. Freshman seminars are offered in all campus departments and undergraduate colleges, and topics vary from quarter to quarter. Enrollment is limited to fifteen to twenty students, with preference given to entering freshmen. *No prerequisites.*

UPPER-DIVISION

Prerequisite: upper-division standing or consent of instructor.

LTCS 100. Theories and Methods in Cultural Studies (4)
Reading in some of the major theoretical texts that have framed work in cultural studies, with particular emphasis on those drawn from critical theory, studies in colonialism, cultural anthropology, feminism, semiotics, gay/lesbian studies, historicism, and psychoanalytic theory. *Prerequisite: upper-division standing.*

LTCS 110. Popular Culture (4)
A reading of recent theory on popular culture and a study of particular texts dealing with popular cultural practices, both contemporary and noncontemporary, as sites of conflict and struggle. Repeatable for credit when topics vary.

LTCS 115. Performance Culture (4)
An investigation of different types of performances such as theatrical genres ranging from melodrama and minstrelsy to various cultural rituals and speech acts. From the perspective of literary studies, performance studies, postcolonial theory, ethnography and theatre history, the course explores race, gender, sexuality, and nation through performance. *Prerequisite: upper-division standing or consent of instructor.*

LTCS 118. Comedy (4)
Comedy in fiction and film from ancient times to contemporary, including the Bible, Aristophanes, Shakespeare, and modern writers and film makers. *Prerequisite: upper-division standing or consent of instructor.*

LTCS 120. Historical Perspectives on Culture (4)
The course will explore the relation among cultural production, institutions, history, and ideology during selected historical periods. In considering different kinds of texts, relations of power and knowledge at different historical moments will be discussed. Repeatable for credit when topics vary.

LTCS 125. Cultural Perspectives on Immigration and Citizenship (4)
Introduction to the studies of cultural dimensions of immigration and citizenship. Examines the diverse cultural texts—literature, law, film, music, the televisual images, etc., that both shape and are shaped by immigration and the idea of citizenship in different national and historical contexts. *Prerequisite: upper-division standing or consent of instructor.*

LTCS 130. Gender, Race/Ethnicity, Class, and Culture (4)
The course will focus on the representation of gender, ethnicity, and class in cultural production in view of various contemporary theories of race, sex, and class. Repeatable for credit when topics vary.

LTCS 135. Interdisciplinary Approaches to Lesbian, Gay, Bisexual, and Transgender Studies (4)
Introduction to interdisciplinary examination of human sexuality and, especially, lesbian, gay, bisexual, and transgender identities and desires. Juxtaposes perspectives from humanities, social sciences, and natural sciences. Introduces queer theory to understand sexuality in relation to phenomena such as government, family, culture, medicine, race, gender, and class.

LTCS 145. National Cultures in Colonial and Postcolonial Contexts (4)
Studies of emergence of national cultures under colonial rule and their transformations in the process of decolonization. Investigation of ideological constructions of such cultural institutions as modern national language, national history and histiography, national literary canon, and folk literature and culture. *Prerequisite: upper-division standing or consent of instructor.*

LTCS 150. Topics in Cultural Studies (4)
The course will examine one or more forms of cultural production or cultural practice from a variety of theoretical and historical perspectives. Topics may include: contemporary debates on culture, genres of popular music/fiction/film, AIDS and culture, the history of sexuality, subcultural styles, etc. Repeatable for credit when topics vary.

LTCS 160. Cultural Studies Approaches to Popular Music (4)
An investigation of different types of popular music genres, cultures, and practices such as hip hop, punk rock, R&B, jazz, country, and dance music cultures. From the perspective of ethnography and cultural and performance studies, the course explores race, gender, sexuality, and the negotiations of local, as well as national communities and subcultures via popular music. *Prerequisite: upper-division standing or consent of instructor.*

LTCS 170. Visual Culture (4)
The course will focus on visual practices and discourses in their intersection and overlap, from traditional media, print, and photography to film, video, TV, computers, medical scanners, and the Internet.

LTCS 198. Directed Group Study (4)
Directed group research, under the guidance of a member of the faculty, in an area not covered in courses currently offered by the department. (P/NP only.) *Prerequisite: permission of the department.*

LTCS 199. Special Studies (2 or 4)
Individual reading in an area not covered in courses currently offered by the department. (P/NP only.) *Prerequisite: permission of the department.*

GRADUATE

LTCS 201. Theories and Methods of Analysis in Cultural Studies (4)
Contemporary theories of cultural studies. The seminar will concentrate on major interpretive approaches drawn from several areas of cultural and political analysis, including historicism, Marxist theory, feminism, structuralism, psychoanalytic theory, semiotics, postmodernist studies, gay and lesbian studies, and others. The particular focus and approach may vary. Repeatable for credit. *Prerequisite: graduate standing or consent of instructor.*

LTCS 210. History and Culture (4)
This seminar will focus on the cultural practices of a particular historical period as a means of analyzing the relation between culture/ideology and economic and political modes of production and domination. Topic, historical period, and theoretical approach may vary. Repeatable for credit. *Prerequisite: graduate standing or consent of instructor.*

LTCS 220. Film/TV/Video Studies (4)
The seminar will concentrate on genres or subgenres within film/TV/video studies or on a stand of film/TV/video theory. Possible topics may include: horror film, melodrama, sitcoms/soaps/talk shows, music videos, black or queer cinema, etc. Repeatable for credit.

LTCS 225. Interdisciplinary and Historical Analysis of Cultural Texts (4)
The seminar will focus on a particular historical period and examine a variety of cultural texts vis-a-vis related historical, economic, political, and sociological discourses. The conjunction and disjunction of approaches will be explored in relation to specific texts. Repeatable for credit.

LTCS 250. Topics in Cultural Studies (4)
This seminar will be organized around any of various topic areas relating to cultural studies. These might include studies in colonialism, historicism, gender, sexuality, social institutions, popular culture, subaltern practices, etc. May be repeated for credit as topics vary. *Prerequisite: graduate standing or consent of instructor.*

LTCS 255. Cultural Studies, Colonialism, and Decolonialism (4)
This course considers different approaches to the study of colonialism in a variety of national contexts. Educational, legal, religious, military, and cultural apparatuses of colonialism, theories of decolonization, the "postcolonial" and feminist critiques of "modernity"/modernization will also be studied. May be repeated for credit when topics vary. *Prerequisite: graduate standing or consent of instructor.*

LTCS 256. Cultural Studies of Technoscience (4)
The course will explore work in cultural studies, feminist studies, and queer theory of scientific practices altering social relations, cultural identities, and conceptions of "nature". Issues may include the AIDS pandemic, genetic research, electronic communities, reproductive technologies, and other topics. May be repeated for credit when topics vary. *Prerequisite: graduate standing or consent of instructor.*

LTCS 296. Research Practicum (1–12)
Research project to be developed by a small group of students under the continued direction of individual faculty members. Primarily a continuation of a previous seminar. The 296 courses do not count toward the seminar requirement. Repeatable for credit.

LTCS 297. Directed Studies: Reading Course (1–12)
This course may be designed according to an individual student's needs when seminar offerings do not cover subjects, genres, or authors of interest. No paper required. The 297 courses do not count toward the seminar requirement. Repeatable for credit.

LTCS 298. Special Projects: Writing Course (1–12)
Similar to a 297, but a paper is required. Papers are usually on subjects not covered by seminar offerings. Up to *two* 298s may be applied toward the twelve-seminar requirement of the doctoral program. Repeatable for credit.

LTCS 299. Dissertation (1–12)
Research toward the dissertation. Open only to Ph.D. students who have advanced to candidacy. Repeatable for credit.

LITERATURES IN ENGLISH

LOWER-DIVISION

LTEN 21. Introduction to the Literature of the British Isles: Pre-1660 (4)
An introduction to the literatures written in English in Britain before 1660, with a focus on the interaction of text and history.

LTEN 22. Introduction to the Literature of the British Isles: 1660–1832 (4)
An introduction to the literatures written in English in Britain and Ireland between 1660 and 1832, with a focus on the interaction of text and history.

LTEN 23. Introduction to the Literature of the British Isles: 1832–Present (4)
An introduction to the literatures written in English in Britain, Ireland, and the British Empire (and the former British Empire) from 1832 to the present, with a focus on the interaction of text and history.

LTEN 25. Introduction to the Literature of the United States, Beginnings to 1865 (4)
An introduction to the literatures written in English in the United States from the beginnings to 1865, with a focus on the interaction of text and history.

LTEN 26. Introduction to the Literature of the United States, 1865 to the Present (4)
An introduction to the literatures written in English in the United States from 1865 to the present, with a focus on the interaction of text and history.

LTEN 27. Introduction to African American Literature (4)
A lecture discussion course that examines a major topic or theme in African American literature as it is developed over time and across the literary genres of fiction, poetry, and belles lettres. A particular emphasis of the course is how African American writers have adhered to or departed from conventional definitions of genre.

LTEN 28. Introduction to Asian-American Literature (4)
This course provides an introduction to the study of the history, communities, and cultures of different Asian-American people in the United States. Students will examine different articulations, genres, conflicts, narrative forms, and characterizations of the varied Asian experience.

LTEN 29. Introduction to Chicano Literature (4)
This course provides an introduction to the literary production of the population of Mexican origin in the United States. Students will examine a variety of texts dealing with the historical (social, economic, and political) experiences of this heterogeneous population.

LTEN 60. Topics in Ethnic American Literature (4)
A lecture and discussion course that critically examines the literary and cultural production emerging out of racialized, ethnic, and immigrant communities in the United States. Course may include fiction, poetry, novels, plays, popular culture, and film.

LTEN 87. Freshman Seminar (1)
The Freshman Seminar Program is designed to provide new students with the opportunity to explore an intellectual topic with a faculty member in a small seminar setting. Freshman seminars are offered in all campus departments and undergraduate colleges, and topics vary from quarter to quarter. Enrollment is limited to fifteen to twenty students, with preference given to entering freshmen. *No prerequisites.*

UPPER-DIVISION

Prerequisite: upper-division standing or consent of instructor. Additional prerequisites may be specified below.

LTEN 107. Chaucer (4)
A study of Chaucer's poetic development, beginning with *The Book of the Duchess* and *The Parliament of Fowls*, including *Troilus* and *Criseyde*, and concluding with substantial selections from *The Canterbury Tales*.

LTEN 110. The Renaissance: Themes and Issues (4)
Major literary works of the Renaissance, an exciting period of social and cultural transformation in England as elsewhere in Europe. Topics may include a central theme (e.g., humanism, reformation, revolution), a genre (e.g., pastoral), or comparison with other arts and sciences.

LTEN 112. Shakespeare I: The Elizabethan Period (4)
A lecture/discussion course exploring the development of Shakespeare's dramatic powers in comedy, history, and tragedy, from the early plays to the middle of his career. Dramatic forms, themes, characters, and styles will be studied in the contexts of Shakespeare's theatre and his society. Enrollment limited to upper-division students.

LTEN 113. Shakespeare II: The Jacobean Period (4)
A lecture/discussion course exploring the rich and varied achievements of Shakespeare's later plays, including the major tragedies and late romances. Dramatic forms, themes, characters, and styles will be studied in the contexts of Shakespeare's theatre and his society. Enrollment limited to upper-division students.

LTEN 114. Shakespeare III: Stage, Film, and Television (4)
A lecture/discussion/laboratory course involving the close study of six to eight plays representative of Shakespeare's artistic career with particular emphasis upon the interrelation of Elizabethan plays and the stage and the critical implications of transposing plays to film and television. (Generally offered in summer session only.)

LTEN 115A. The Sixteenth Century: Themes and Issues (4)
Selected topics concerned with sixteenth-century English literature as a whole.

LTEN 117A. The Seventeenth Century: Themes and Issues (4)
Selected topics in English literature during a period of social change, religious controversy, emergence of the "New Science", and the English Civil War. Readings chosen from writers including Jonson, Donne, Bacon, Milton, Marvell, and Dryden, among others. Repeatable for credit. *Prerequisite: upper-division standing or consent of instructor.*

LTEN 118. Milton (4)
A critical examination of the major works, including *Paradise Lost*, by an author who was both a central figure in English political life in a revolutionary age and, in the view of most critics, the greatest non-dramatic poet in the English language. The course will study his poetic development in a variety of historical contexts.

LTEN 119. Restoration Literature (4)
The literature of a period following twenty years of civil war and revolution which saw the reopening of theatres and the rise of the professional writer. Topics may include Restoration comedy and tragedy; satire; neoclassical literary theory.

LTEN 120A. The Eighteenth Century: Themes and Issues (4)
Selected topics in English literature during an age of satiric writing, the shift from neoclassicism to romanticism, the emergence of the novel, and the expansion of the reading and writing public among the middle class and women. Writers such as Defoe, Pope, Swift, Richardson, Johnson, Burney, Wollstonecraft. May be repeated for credit when topics vary.

LTEN 120D. William Blake and the Age of Sensibility (4)
A study of the great visionary poet and artist, William Blake, in the context of several of his eighteenth-century contemporaries, such as Gray, Collins, Chatterton, and Cowper.

LTEN 120E. Women in the Eighteenth Century (4)
Selected topics concerning British women writers and readers in an age of increasing female participation in print culture. Topics include women writers; representations of women, domesticity, and the family in the novel, in drama, in satire; early feminist writing; literary constructions of gender. May be repeated for credit when topics vary.

LTEN 124. The Nineteenth Century: Themes and Issues (4)
Selected topics in nineteenth-century British literature and culture, drawing on both romantic and Victorian periods: e.g., relationships between literature and imperialism, social and political debate, gender issues, religion, or science; or continuities between romantic and Victorian authors.

LTEN 125A. Romanticism: Themes and Issues (4)
Selected topics concerned with the romantic period as a whole.

LTEN 125B. First Generation Romantic Poets (4)
The poets who came of age during the French Revolution and who inaugurated literary modes that continue in our own time: Wordsworth, Coleridge, Blake, and their contemporaries.

LTEN 125C. Second Generation Romantic Poets (4)
Byron, Keats, Shelley, and their contemporaries.

LTEN 125F. Byron and Byronism (4)
Lord Byron's life, works, and cultural impact, including an examination of some later authors, such as Carlyle and the Brontes, who responded to Byron through their own writings.

LTEN 125G. Keats and His Poetical Heirs (4)
The major poetry of John Keats considered together with selected works influenced by him, including poems by such authors as Tennyson, Christina Rossetti, Hopkins, Hardy, Yeats, and Stevens.

LTEN 127A. The Victorian Period: Themes and Issues (4)
Selected topics concerned with Victorian literature as a whole.

LTEN 127B. Victorian Poetry (4)
Tennyson, Browning, Arnold, Clough, Hopkins, and their contemporaries.

LTEN 130. Modern British Literature (4)
Selected topics concerned with modern British literature; study of various authors, issues, and trends in literatures of the British Isles from the mid-1850s through the end of the twentieth century. Repeatable for credit when topics vary. (Replaces the former LTEN 130A and 130B)

LTEN 132. Modern Irish Literature (4)
The Irish Revival and its aftermath: Yeats, Synge, O'Casey, Joyce, Beckett, and their contemporaries.

LTEN 133. Modern Scottish Literature (4)
This course takes Scottish writing from the Kailyard School of the late nineteenth century through the 1920s' revival of Scottish nationalism, to the 1980s' emergence of Glasgow as a literary center.

LTEN 134. Twentieth-Century British Poetry (4)
Survey of many poets of the United Kingdom including Scotland and Ireland. Included: War poems (1914-18, 1940-45), '30s poems of social commitment, the Movement (1950s), recent postmodern figures (Hughes, Prynne). *Prerequisite: upper-division standing.*

LTEN 140. The Early Nineteenth-Century British Novel (4)
Includes the work of Jane Austen, Charlotte Bronte, Emily Bronte, Mary Shelly, and Charles Dickens.

LTEN 141. The High Victorian Novel (4)
Dickens, Thackeray, Trollope, Charlotte Bronte, Emily Bronte.

LTEN 142. The End of Victorianism (4)
The work of Robert Louis Stevenson, H.G. Wells, Thomas Hardy, Rudyard Kipling, and Joseph Conrad.

LTEN 143. The English Novel in the Eighteenth Century (4)
This course studies the writing of the novel in the eighteenth century. The focus of the course may be an introduction to selected major writers and texts, or a particular issue or problem in the literary and social history of the novel. May be repeated for credit when topics vary.

LTEN 144. The English Novel in the Nineteenth Century (4)
This course studies the writing of the novel in English during the nineteenth century. The focus of the course may be a survey of the nineteenth century (an introduction to selected major writers and texts), or a particular issue or problem in the literary and social history of the novel. May be repeated for credit when topics vary.

LTEN 145. The English Novel in the Twentieth Century (4)
This course studies the writing of the novel in English during the twentieth century. The focus of the course may be an introduction to selected major writers and texts, or a particular issue or problem in the literary and social history of the novel. May be repeated for credit when topics vary.

LTEN 146. Women and English/American Literature (4)
Selected topics concerning women and anglophone literature. Topics include women writers, the literary representation of women, and women as readers. May be repeated for credit when topics vary.

LTEN 147. Metamorphoses of the Symbol (4)
An investigation of a single symbol–such as the cave or the mountain–as it functions within the literature and other expressions of widely different historical moments, with an emphasis upon English and American literature. May be repeated for credit as topics vary.

LTEN 148. Genres in English and American Literature (4)
An examination of one or more genres in English and/or American literature, for example, satire, utopian fiction, autobiography, landscape poetry, the familiar essay. May be repeated for credit as topics vary.

LTEN 149. Themes in English and American Literature (4)
A consideration of one of the themes that recur in many periods of English or American literature, for

instance, love, politics, the role of women in society. May be repeated for credit as topics vary.

LTEN 150. Gender, Text, and Culture (4)
This course studies representations of the sexes and of their interrelationship in various forms of writing produced during different phases of English history. Emphasis will be placed upon connections of gender and of literature to other modes of social belief, experience, and practice. Repeatable for credit when topics vary.

LTEN 152. The Origins of American Literature (4)
Studies in American writing from the Puritans to the early national period (1620–1830), with emphasis on the thrust and continuity of American culture, social and intellectual, through the beginnings of major American writing in the first quarter of the nineteenth century.

LTEN 153. The Revolutionary War and the Early National Period in U.S. Literature (4)
A critical examination of how writing of various kinds—political, philosophical, and literary—functioned in the construction of the political body of the new American republic and the self-conception of its citizens.

LTEN 154. The American Renaissance (4)
A study of some of the chief works, and the linguistic, philosophical, and historical attitudes informing them, produced by such authors as Emerson, Hawthorne, Melville, Dickinson, and Whitman during the period 1836–1865, when the role of American writing in the national culture becomes an overriding concern.

LTEN 155. Interactions Between American Literature and the Visual Arts (4)
An exploration of the parallels between the work of individual writers, or movements, in American literature and the style and content of the work of certain visual artists. The writers studied are always American; the artists or art movements may represent non-American influences on these American writers. May be repeated for credit as topics vary.

LTEN 156. American Literature from the Civil War to World War I (4)
A critical examination of works by such authors as Mark Twain, Henry James, Kate Chopin and Edith Wharton, who were writing in an age when the frontier was conquered and American society began to experience massive industrialization and urbanization.

LTEN 158. Modern American Literature (4)
A critical examination of American literature in several genres produced between the turn of the century and World War II. Attention will be given to historical and cultural contexts for defining American modernism. *Prerequisite: upper-division standing*. Repeatable for credit when topics vary.

LTEN 159. Contemporary American Literature (4)
A critical examination of American literature in several genres produced since World War II. Attention will be given to historical and cultural contexts for defining American postmodernism. *Prerequisite: upper-division standing*. Repeatable for credit when topics vary.

LTEN 160. Ideas and Photographic Images in American Culture (4)
Relate the history of photography in America to the history of ideas in American culture. It assumes that photographers think in images and through their images participate in cultural discourse. Repeatable for credit when topics vary.

LTEN 172. American Poetry II—Whitman through the Modernists (4)
Reading and interpretation of American poets from Whitman through the principal modernists—Pound, H.D., Eliot, Moore, Stevens, and others. Lectures will set the appropriate context in sociocultural and literary history.

LTEN 174. American Fiction II—Since Middle James (4)
Reading and interpretation of American fiction from Henry James through the principal modernists—Fitzgerald, Stein, Welty, Faulkner, and others. Lectures will set the appropriate context.

LTEN 175A. New American Fiction—Post-World War II to the Present (4)
Reading and interpretation of American fiction from the mid-1940s to the present. Lectures will set the appropriate context in sociocultural and literary history. May be repeated for credit when topics vary.

LTEN 175B. New American Poetry—Post-World War II to the Present (4)
Reading and interpretation of American poets whose work has made its major impact since the last war, for instance Charles Olson, Robert Creeley, Denise Levertov, Adrienne Rich, Allen Ginsberg, Frank O'Hara, and John Ashbery. Lectures will set the appropriate context in sociocultural and literary history. May be repeated for credit as topics vary.

LTEN 176. Major American Writers (4)
A study in depth of the works of major American writers. May be repeated for credit as topics vary.

LTEN 177. California Literature (4)
Reading and interpretation of such novelists as London, Norris, Steinbeck, West, and Didion and such poets as Jeffers, Rexroth, Everson, Duncan, and Snyder. May be repeated for credit as topics vary.

LTEN 178. Comparative Ethnic Literature (4)
A lecture-discussion course that juxtaposes the experience of two or more U.S. ethnic groups and examines their relationship with the dominant culture. Students will analyze a variety of texts representing the history of ethnicity in this country. Topics will vary.

LTEN 180. Chicano Literature in English (4)
Introduction to the literature in English by the Chicano population, the men and women of Mexican descent who live and write in the United States. Primary focus on the contemporary period.

LTEN 181. Asian American Literature (4)
Selected topics in the literature by men and women of Asian descent who live and write in the United States. Repeatable for credit when topics vary.

LTEN 183. African American Prose (4)
Analysis and discussion of the novel, the personal narrative, and other prose genres, with particular emphasis on the developing characteristics of African American narrative and the cultural and social circumstances that influence their development.

LTEN 184. African American Poetry (4)
Close reading and analysis of selected works of African American poetry as they reflect styles and themes that recur in the literature.

LTEN 185. Themes in African American Literature (4)
An intensive examination of a characteristic theme, special issue, or period in African American literature. May be repeated for credit when topics vary.

LTEN 186. Literature of the Harlem Renaissance (4)
The Harlem Renaissance (1917–39) focuses on the emergence of the "New Negro" and the impact of this concept on black literature, art, and music. Writers studied include Claude McKay, Zora N. Hurston, and Langston Hughes. Special emphasis on new themes and forms.

LTEN 187. Black Music/Black Texts: Communication and Cultural Expression (4)
Explores roles of music as a traditional form of communication among Africans, Afro-Americans, and West-Indians. Special attention given to poetry of black music, including blues and other forms of vocal music expressive of contestatory political attitudes. *Prerequisite: upper-division standing.*

LTEN 188. Contemporary Caribbean Literature (4)
This course will focus on contemporary literature of the English-speaking Caribbean. The parallels and contrasts of this Third World literature with those of the Spanish- and French-speaking Caribbean will also be explored.

LTEN 189. Twentieth-Century Postcolonial Literatures (4)
The impact of British colonialism, national independence movements, postcolonial cultural trends, and women's movements on the global production of literary texts in English. Course is organized by topic or geographical/historical location. May be repeated for credit when topics vary. *Prerequisite: upper-division standing or consent of instructor.*

LTEN 190. Seminars (4)
These seminars are devoted to a variety of special topics, including the works of single authors, genre studies, problems in literary history, relations between literature and the history of ideas, literary criticism, literature and society, and the like. The student may enroll in more than one section in a single quarter.

LTEN 196. Honors Thesis (4)
Senior thesis research and writing for students who have been accepted for the Literature Honors Program and who have completed LTGN 191. Oral exam.

LTEN 198. Directed Group Study (4)
Research seminars and research, under the direction of a member of the staff. May be repeated for credit three times. (P/NP grades only.) *Prerequisite: permission of department.*

LTEN 199. Special Studies (2 or 4)
Tutorial; individual guided reading in an area not normally covered in courses. May be repeated for credit three times. (P/NP grades only.) *Prerequisite: permission of department.*

GRADUATE

Prerequisite: graduate standing or consent of instructor.

LTEN 222. Elizabethan Studies (4)
Selected topics in the study of literary, dramatic, and other Elizabethan cultural texts. Emphasis will be upon articulations among a range of discourses, practices, and institutions. May be repeated for credit when topics vary.

LTEN 224. Seventeenth-Century English Literature (4)
Consideration of one or more figures, texts, or trends in seventeenth-century English literature, including the

metaphysical poets and Jacobean drama. May be repeated for credit as topics vary.

LTEN 226. Shakespeare (4)
Shakespeare's plays in relation to the Elizabethan background; selected major texts. May be repeated for credit as topics vary.

LTEN 231. Restoration and Eighteenth-Century English Literature (4)
Consideration of one or more figures, texts, or trends in Restoration and eighteenth-century English literature, including Dryden, Pope, Swift, the early novel, satire. May be repeated for credit as topics vary.

LTEN 241. English Literature of the Romantic Period (4)
A study of the major poetry and related prose of early nineteenth-century literature. May be repeated for credit as topics vary.

LTEN 243. Early American Literature and Culture (4)
Consideration of one or more major figures, texts, or trends in Colonial and/or Revolutionary period American Literature, in particular, the relationship between literature and culture. *Prerequisite: graduate standing.*

LTEN 245. Nineteenth-Century American Studies (4)
Consideration of some of the principal writers and movements in nineteenth-century American literature. May be repeated for credit as topics vary.

LTEN 246. Victorian Literature (4)
Consideration of one or more major figures, texts, or trends in the Victorian period. May be repeated for credit as topics vary.

LTEN 252. Studies in Modern American Literature and Culture (4)
Consideration of one or more major figures, texts, or trends in American literature, in particular the relationship between literature and culture. May be repeated for credit as topics vary.

LTEN 256. Postcolonial Discourses (4)
A survey of selected responses to imperialism and colonialism as presented in cultural texts produced by colonized or once-colonized peoples. Related issues to be examined: gender dynamics, class, representing others, mimicry, language, cultural theory, and the politics of literary genres. May be repeated for credit when topics vary.

LTEN 271. Genres in English (4)
Consideration of one or more genres present in English and/or American literature; for instance, the ballad, landscape poetry, comedy, satire, the familiar essay. May be repeated for credit when topics vary. *Prerequisites: graduate standing or consent of instructor.*

LTEN 272. Cultural Traditions in English (4)
The study of writing produced over an extended period of time by members of an identifiable cultural formation as defined, e.g., by political/social ideology, class, religion, ethnicity, or sexual preference. May be repeated for credit when topics vary.

LTEN 281. Practicum in Literary Research and Criticism (4)
This course will focus on strategies for framing, organizing, and drafting projects in literary research. Students will study and apply various forms of literary methodology and will learn about recent developments in bibliography, textual editing, and research. May be repeated twice for credit as topics vary.

LTEN 295. M.A. Thesis (1-8)
Research for the master's thesis. Opened for repeated registration.

LTEN 296. Research Practicum (1-12)
Research project to be developed by a small group of students under the continued direction of individual faculty members. Primarily a continuation of a previous graduate seminar. The 296 courses do not count toward the seminar requirement. Repeatable for credit.

LTEN 297. Directed Studies: Reading Course (1-12)
This course may be designed according to an individual student's needs when seminar offerings do not cover subjects, genres, or authors of interest. No paper required. The 297 courses do not count toward the seminar requirement. Repeatable for credit.

LTEN 298. Special Projects: Writing Course (1-12)
Similar to a 297, but a paper is required. Papers are usually on subject not covered by seminar offerings. Up to two 298s may be applied toward the twelve-seminar requirement of the doctoral program. Repeatable for credit.

LTEN 299. Dissertation (1-12)
Research for the dissertation. Offered for repeated registration. Open only to Ph.D. students who have advanced to candidacy.

LITERATURES IN FRENCH

LOWER-DIVISION

Language and Literature Courses

Ordinarily, students entering the French literature program elect one of the following sequences: LTFR 2A, 2B, and 2C; or 2A, 2B, and 50.

LTFR 2A. Intermediate French I (5)
The first course in a three-quarter sequence designed to prepare students for upper-division French courses. The course is taught entirely in French and emphasizes the development of reading ability, listening comprehension, and conversational and writing skills. It also introduces the student to basic techniques of literary analysis. It is expected that this sequence will be completed in the course of one academic year. This course may not be repeated for credit. *Prerequisites: LTFR 1C/CX or its equivalent, score of 3 on French language AP exam or consent of instructor.*

LTFR 2B. Intermediate French II (5)
The second course in a three-quarter sequence designed to prepare students for upper-division French courses. The course is taught entirely in French and emphasizes the development of reading ability, listening comprehension, and conversational and writing skills. It also introduces the student to basic techniques of literary analysis. It is expected that this sequence will be completed in the course of one academic year. This course may not be repeated for credit. *Prerequisites: LTFR 2A or its equivalent, score of 4 on French language or 3 French literature AP exams or consent of instructor.*

LTFR 2C. Intermediate French III: Composition and Cultural Topics (4)
Designed to improve writing and conversational skills. Aims to develop written expression in terms of organization of ideas, structure, vocabulary. Grammar review. Discussions of a contemporary novel and film. May be taken in lieu of LTFR 50 as a prerequisite for upper-division courses. *Prerequisites: LTFR 2B or its equivalent, score of 5 on French language or 4 French literature AP exams or consent of instructor.*

LTFR 21. Conversation Workshop I (1)
Designed to allow students to practice and develop their oral skills by expanding the vocabulary necessary to discuss abstract ideas and by building up the confidence necessary to participate in literature classes. *Prerequisite: LIFR 1C/1CX or 1D/1DX or LTFR 2A or LTFR 2B or LTFR 2C or LTFR 50 or consent of instructor.*

LTFR 31. Conversation Workshop II (1)
A one-credit, one-class-a-week course. Designed to develop and maintain oral skills at an advanced level by discussing current cultural issues of the francophone world. *Prerequisite: LTFR 2B or LTFR 2C or LTFR 50, or consent of instructor.*

LTFR 50. Intermediate French III: Textual Analysis (4)
The third course in a three-quarter sequence designed to prepare students for upper-division French courses. The course is taught entirely in French and emphasizes the development of reading ability, listening comprehension, and conversational and writing skills. It also introduces the student to basic techniques of literary analysis. It is expected that this sequence will be completed in the course of one academic year. This course may not be repeated for credit. *Prerequisites: LTFR 2B or its equivalent, score of 5 on French language AP exam or consent of instructor.*

LTFR 60A. French for Reading Knowledge I (2)
A course designed for undergraduate and graduate students interested in developing reading skills only. No previous knowledge of French required. Texts are taken primarily from the Humanities and Social Sciences.

LTFR 60B. French for Reading Knowledge II (2)
A continuation of the course for undergraduate and graduate students interested in developing reading skills only. No previous course work in French required, though recommended. Texts are taken primarily from the Humanities and Social Sciences.

UPPER-DIVISION

Prerequisite: upper-division standing or consent of instructor. All upper-division courses are taught in French. Additional prerequisites may be specified below.

Students are strongly encouraged to take LTFR 115 and 116 before enrolling in other upper-division French literature courses.

LTFR 115. Themes in Intellectual and Literary History (4)
This is the first course in a two-quarter sequence designed as an introduction to French literature and literary history. Each quarter will center on a specific theme or problem. It is recommended that majors whose primary literature is French take this sequence as early as possible. *Prerequisites: LTFR 50 and LTFR 2C.*

LTFR 116. Themes in Intellectual and Literary History (4)
This is the second course in a two-quarter sequence designed as an introduction to French literature and

literary history. Each quarter will center on a specific theme or problem. It is recommended that majors whose primary literature is French take this sequence as early as possible. *Prerequisites: LTFR 50 and LTFR 2C.*

LTFR 121. The Middle Ages and the Renaissance (4)
Major literary works of the Middle Ages and Renaissance as seen against the historical and intellectual background of the period. Medieval texts in modern French translation. May be repeated for credit as topics vary. *Prerequisite: LTFR 115.*

LTFR 123. Eighteenth Century (4)
Major literary works and problems of the eighteenth century. May be repeated for credit as topics vary. *Prerequisite: LTFR 115.*

LTFR 124. Nineteenth Century (4)
Major literary works of the nineteenth century. May be repeated for credit as topics vary. *Prerequisite: LTFR 116.*

LTFR 125. Twentieth Century (4)
Major literary works and problems of the twentieth century. May be repeated for credit as topics vary. *Prerequisite: LTFR 116.*

LTFR 141. Literatures in French (4)
One or more periods or authors in French literature. Texts will be read in the original language. May be repeated for credit as topics vary.

LTFR 142. Literary Genres (4)
An examination of one or more major or minor genres of French literature: for example, drama, novel, poetry, satire, prose poem, essay.

LTFR 143. Major Authors (4)
A study in depth of the works of a major French writer. Recommended for students whose primary literature is French. May be repeated for credit as topics vary.

LTFR 144. Literature and Ideas (4)
This course will center on writers or movements of international literary, cultural, or ideological significance. May be repeated for credit when topics vary.

LTFR 160. Advanced Grammar and Stylistics (4)
A course for students who wish to perfect their knowledge of evolving French grammar and to increase their sensitivity to style while improving their written and spoken French.

LTFR 164. Cultural Topics (4)
A course on changing topics such as France during the 60s, contemporary social and cultural structures (the school system, economy, political parties), myths of America in France, etc. *Prerequisite: LTFR 116.*

LTFR 170. Film (4)
May include close analysis of films made in the French-speaking world from 1895 to the present; study of film theory, history, criticism; social contexts of films' emergence and changing contexts of reception; particular movement, styles, or individual directors' work.

LTFR 196. Honors Thesis (4)
Senior thesis research and writing for students who have been accepted for the Literature Honors Program and who have completed LTGN 191. Oral exam.

LTFR 198. Directed Group Study (4)
Research seminars and research, under the direction of a member of the staff. (P/NP grades only.) *Prerequisites: upper-division standing and special permission of department.*

LTFR 199. Special Studies (2 or 4)
Tutorial; individual guided reading in areas of French literature not normally covered in courses. (P/NP grades only.) *Prerequisites: upper-division standing and permission of department.*

GRADUATE

LTFR 240. Topics in French Literature (4)
An examination of one or more major topics in French literature. May be repeated for credit when topics vary. *Prerequisite: graduate standing or consent of instructor.*

LTFR 295. M.A. Thesis (1-8)
Research for the master's thesis. Opened for repeated registration up to eight units.

LTFR 296. Research Practicum (1-12)
Research project to be developed by a small group of students under the continued direction of individual faculty members. Primarily a continuation of a previous graduate seminar. The 296 courses do not count toward the seminar requirement. Repeatable for credit. *Prerequisite: consent of the instructor.*

LTFR 297. Directed Studies: Reading Course (1-12)
This course may be desinged according to an individual student's needs when seminar offerings do not cover subjects, genres, or authors of interest. No paper required. The 297 courses do not count toward the seminar requirement. Repeatable for credit. *Prerequisite: consent of the instructor.*

LTFR 298. Special Projects: Writing Course (1-12)
Similar to a 297, but a paper is required. Papers are usually on subjects not covered by seminar offerings. Up to two 298s may be applied toward the twelve-seminar requirement of the doctoral program. Repeatable for credit. *Prerequisite: consent of the instructor.*

LTFR 299. Dissertation (1-12)
Research for the dissertation. Offered for repeated registration. Open only to Ph.D. students who have advanced to candidacy.

LITERATURES IN GERMAN

LOWER-DIVISION

Language and Literature Courses

LTGM 2A. Intermediate German I (5)
LTGM 2A follows the basic language sequence of the Department of Linguistics and emphasizes the development of reading ability, listening comprehension, and conversational and writing skills. The course includes grammar review and class discussion of reading and audio-visual materials. Specifically, the course prepares students for LTGM 2B and 2C. *Prerequisites: LIGM 1C/1CX or its equivalent or score of 3 on AP German language exam or consent of instructor.*

LTGM 2B. Intermediate German II (5)
LTGM 2B is a continuation of LTGM 2A for those students who intend to practice their skills in reading, listening comprehension, and writing on a more advanced level. The literary texts are supplemented by readings from other disciplines as well as audio-visual materials. *Prerequisites: LTGM 2A or score of 4 on AP German language exam or consent of instructor.*

LTGM 2C. Intermediate German III (4)
A course designed for students who wish to improve their ability to speak and write German. Students will read and discuss a variety of texts and films, and complete the grammar review begun in 2A. 2C emphasizes speaking, writing, and critical thinking, and prepares students for upper-division course work in German. *Prerequisites: LTGM 2B or equivalent or score of 5 on AP German language exam or consent of instructor.*

LTGM 60A. German for Reading Knowledge I (2)
A program for graduate and undergraduate students interested in developing reading skills only. No previous knowledge of German required. Texts are taken primarily from the humanities and social sciences, and include selections from publishers' catalogs, scholarly articles, and books.

LTGM 60B. German for Reading Knowledge II (2)
A continuation of the program for graduate and undergraduate students interested in developing reading skills only. No previous knowledge of German required, though recommended. Texts are taken primarily from the humanities and social sciences and include selections from publishers' catalogs, scholarly articles, and books.

UPPER-DIVISION

Prerequisite: upper-division standing or consent of instructor. Additional prerequisites may be specified below.

LTGM 100. German Studies I: Aesthetic Cultures (4)
This course offers an overview of German aesthetic culture in its various forms (literature, film, art, music, and architecture) and methods of analysis. Materials will explore the diversity of aesthetic production from the eighteenth century to the present.

LTGM 101. German Studies II: National Identities (4)
This course offers an overview of issues in contemporary and historical German cultures. How has national identity been constructed in the past? What does it mean to be a German in the new Europe? Materials include fiction, historical documents, films, and the Internet.

LTGM 123. Eighteenth-Century German Literature (4)
Major literary works as seen against the historical and intellectual background of the period. May be repeated for credit when topics vary. *Prerequisite: upper division standing or consent of instructor.*

LTGM 125. Nineteenth-Century German Literature (4)
Major literary works, authors, or movements of the nineteenth century. May be repeated for credit as topics vary.

LTGM 126. Twentieth-Century German Literature (4)
Major literary works, authors, or movements of the twentieth century. May be repeated for credit as topics vary.

LTGM 130. German Literary Prose (4)
The development of major forms and modes of German literary prose. May be repeated for credit as topics vary.

LTGM 131. German Dramatic Literature (4)
The development of the drama in Germany. May be repeated for credit as topics vary.

LTGM 132. German Poetry (4)
The development of major forms and modes of German verse. May be repeated for credit as topics vary.

LTGM 190. Seminars (4)
These seminars are devoted to a variety of special topics, including the works of single authors, genre studies, problems in literary history, relations between literature and the history of ideas, literary criticism, literature and society, and the like.

LTGM 196. Honors Thesis (4)
Senior thesis research and writing for students who have been accepted for the Literature Honors Program and who have completed LTGN 191. Oral exam.

LTGM 198. Directed Group Study (4)
Research seminars and research, under the direction of a member of the staff. May be repeated for credit. (P/NP grades only.) *Prerequisite: permission of department.*

LTGM 199. Special Studies (2 or 4)
Tutorial; individual guided reading in areas of German literature not normally covered in courses. May be repeated for credit three times. (P/NP grades only.) *Prerequisites: upper-division standing and permission of department.*

GRADUATE

LTGM 242. Nineteenth-Century German Literature (4)
Consideration of one or more major figures, texts, or trends in nineteenth-century German literature. Topic varies. May be repeated for credit.

LTGM 272. Genres, Trends, and Forms (4)
Seminars on literary genres, trends, movements, schools, and on aspects of literary forms and structures in any given era or over a certain period of time. May be repeated for credit as topics vary.

LTGM 295. M.A. Thesis (1)
Research for the master's thesis. Opened for repeated registration up to eight units.

LTGM 296. Research Practicum (1-12)
Research project to be developed by a small group of students under the continued direction of individual faculty members. Primarily a continuation of a previous graduate seminar. The 296 courses do not count toward the seminar requirement. Repeatable for credit.

LTGM 297. Directed Studies: Reading Course (1-12)
This course may be designed according to an individual student's needs when seminar offerings do not cover subjects, genres, or authors of interest. No paper required. The 297 courses do not count toward the seminar requirement. Repeatable for credit.

LTGM 298. Special Projects: Writing Course (1-12)
Similar to a 297, but a paper is required. Papers are usually on subjects not covered by seminar offerings. Up to two 298s may be applied toward the twelve-seminar requirement of the doctoral program. Repeatable for credit.

LTGM 299. Dissertation (1-12)
Research for the dissertation. Offered for repeated registration. Open only to Ph.D. students who have advanced to candidacy.

GREEK LITERATURE

(See also listings under Classical Studies)

LOWER-DIVISION

LTGK 1. Beginning Greek (4)
Study of ancient Greek, including grammar and reading.

LTGK 2. Intermediate Greek (I) (4)
Continuation of study of ancient Greek, including grammar and reading. *Prerequisite: LTGK 1 or equivalent.*

LTGK 3. Intermediate Greek (II) (4)
Continuation of study of ancient Greek, including grammar and reading of texts. *Prerequisites: LTGK 1 and 2 or equivalent.*

UPPER-DIVISION

Prerequisite: upper-division standing or consent of instructor. Additional prerequisites may be specified below.

LTGK 101. Greek Composition (4)
Greek prose composition. *Corequisites: student must be concurrently enrolled in upper-division Literature/Greek course numbered 110 or above.*

LTGK 110. Archaic Period (4)
Readings, in Greek, of texts from the archaic period. May be repeated for credit as topics vary.

LTGK 112. Homer (4)
Readings from the works of Homer. Repeatable for credit when texts and material vary.

LTGK 113. Classical Period (4)
Readings, in Greek, of texts from the fifth and fourth centuries B.C. May be repeated for credit as topics vary.

LTGK 118. Hellenistic Period (4)
Reading, in Greek, of texts from Hellenistic period. *Prerequisites: LTGK 1, 2, 3, or equivalent.*

LTGK 120. New Testament Greek (4)
Readings, in Greek, in the Greek New Testament. May be repeated for credit as topics vary.

LTGK 130. Tragedy (4)
Readings, in Greek, of one or more of the works of the classical tragedians Aeschylus, Sophocles, and Euripides. May be repeated for credit as topics vary.

LTGK 131. Comedy (4)
Readings, in Greek, of one or more of the works of Aristophanes. *Prerequisite: LTGK 1, 2, and 3, or equivalent.*

LTGK 132. History (4)
Readings, in Greek, in the works of the ancient historians, including Herodotus, Thucydides, Xenophon, and others. May be repeated for credit as topics vary.

LTGK 133. Prose (4)
Readings, in Greek, in the works of ancient prose writers. May be repeated for credit as topics vary.

LTGK 135. Lyric Poetry (4)
Readings, in Greek, of the works of the ancient lyric poets. May be repeated for credit as topics vary.

LTGK 198. Directed Group Study (4)
Directed group study in areas of Greek literature not normally covered in courses. May be repeated for credit three times. (P/NP grades only.) *Prerequisites: upper-division standing and permission of department.*

LTGK 199. Special Studies (2 or 4)
Tutorial; individual guided reading in areas of Greek literature not normally covered in courses. May be repeated for credit three times. (P/NP grades only.) *Prerequisites: upper-division standing and permission of department.*

GRADUATE

LTGK 297. Directed Studies (1-12)
Guided and supervised reading in a broad area of Greek literature. Offered for repeated registration.

LTGK 298. Special Projects (4)
Treatment of a special topic in Greek literature. Offered for repeated registration.

HEBREW LITERATURE

Please see Near Eastern Literatures under Literatures of the World.

LITERATURES IN ITALIAN

LOWER-DIVISION

(See Department of Linguistics for other course offerings in first-year Italian.)

LTIT 1A. The Language of Italian Culture I (4)
An introduction to the study of the Italian language. Exercises in grammar, syntax, conversation, and writing are generated from the texts of Italian plays (Goldoni, Pirandello, Campanile, Fo). No prior study of Italian required.

LTIT 1B. The Language of Italian Culture II (4)
A continued study of the elements of Italian conversation and grammar based on cultural texts: an opera libretto, a short mystery, short movies. *Prerequisite: LTIT 1A or consent of instructor.*

LTIT 1C. The Language of Italian Culture III (4)
Further study of Italian conversation and grammar based on cultural texts: a short novel, folk music lyrics. Preparation for the second-year Italian literature/language sequence. *Prerequisite: LTIT 1B or consent of instructor.*

LTIT 2A. Intermediate Italian I (5)
A second-year course in Italian language and literature. Conversation, composition, grammar review, and an introduction to literary and nonliterary texts. *Prerequisite: LIIT 1C or LIIT 1C/1CX or its equivalent or consent of instructor.*

LTIT 2B. Intermediate Italian II (5)
Continuation of second-year Italian language and literature. Reading, writing, conversation, grammar review, and an introduction to literary genres and contemporary Italian culture and society. *Prerequisite: LTIT 2A or its equivalent or consent of instructor.*

LTIT 50. Advanced Italian (4)
This course constitutes the sixth and final quarter of the Italian language sequence. It offers an intensive study of Italian grammar, drills in conversation and composition, and readings in modern Italian literature. *Prerequisite: LTIT 2A and 2B, or consent of instructor.*

UPPER-DIVISION

Prerequisite: upper-division standing or consent of instructor. Additional prerequisites may be specified below.

LTIT 100. Introduction to Literatures in Italian (4)
Reading and discussion of selections from representative authors. Review of grammar as needed. *Prerequisite: LTIT 50 or equivalent or consent of instructor.*

LTIT 110. Italian Literature (4)
One or more periods of authors in Italian literature. May be repeated for credit as topics vary.

LTIT 113. Love, War, and Conquest in the Italian Renaissance (4)
A critical reading of Italian Renaissance texts with special attention to those themes, forms, and ideological conflicts still operative in today's culture. May be repeated for credit when topics vary.

LTIT 115. Medieval Studies (4)
Studies in medieval culture and thought with focus on one of the "three crowns" of Italian literature: Dante, Boccaccio, or Petrarca. May be repeated for credit when course content varies. *Prerequisite: upper-division standing or consent of instructor.*

LTIT 122. Studies in Modern Italian Culture (4)
Politics, literature, and cultural issues of twentieth-century Italy. May be repeated for credit when topics vary.

LTIT 137. Studies in Modern Italian Prose (4)
A study of the chief modern Italian prosatori, including D'Annunzio, Calvino, Pavese, Pasolini, etc.

LTIT 140. Women in Italy (4)
A study of historical, political, and literary texts regarding women and feminism in Italian society.

LTIT 143. Major Italian Authors (4)
A study in depth of the works of a major Italian author. May be repeated for credit when topics vary. *Prerequisite: LTIT 100 or permission of instructor.*

LTIT 161. Advanced Stylistics and Conversation (4)
Analysis of Italian essays, journalism, literature. Intensive practice in writing and Italian conversation. *Prerequisite: LTIT 100 or consent of instructor.*

LTIT 196. Honors Thesis (4)
Senior thesis research and writing for students who have been accepted for the literature honors program and who have completed General Literature 191. Oral examination. *Prerequisite: departmental approval.*

LTIT 198. Directed Group Study (4)
Directed group study in areas of Italian literature not normally covered in courses. May be repeated for credit three times. (P/NP grades only.) *Prerequisites: upper-division standing and permission of department.*

LTIT 199. Special Studies (2 or 4)
Tutorial; individual guided reading in areas of Italian literature not normally covered in courses. May be repeated for credit three times. (P/NP grades only.) *Prerequisites: upper-division standing and permission of department.*

GRADUATE

LTIT 297. Directed Studies (1-12)
Guided and supervised reading in a broad area of Italian literature. Offered for repeated registration.

The following summer session courses may be of interest:

LTIT 7A-B-C. Introductory Intensive Italian (4-4-4)
The equivalent of a full year of Italian language is covered. Through a total immersion approach, students will be able to develop proficiency in grammar, essential reading and writing skills, basic comprehension and production of spoken Italian and language functions. Given in summer session only.

LTIT 40. Conversational Intermediate Italian (4)
Students improve their verbal skills through group conversations about issues relevant to modern life in Italy and their own life in America. Italian current events and society are discussed; students contribute oral presentations on Italian topics. Given in summer session only. *Prerequisite: Linguistics/Italian 1C/1CX or consent of instructor.*

KOREAN LITERATURE

LTKO 1A-B-C. Beginning Korean: First Year I-II-III (5-5-5)
This course will help students develop beginning-level skills in the Korean language, beginning with an introduction to the writing and sound system of the Korean language. The remainder of the course will focus on basic sentence structures and expressions. *Prerequisites: no prerequisite for 1A, but a placement test is required. 1A is a prerequisite to 1B; 1B is a prerequisite to 1C.*

LTKO 2A-B-C. Intermediate Korean: Second Year I-II-III (5-5-5)
This course will help students develop intermediate-level skills in the Korean language. Upon completion of this course, students are expected to have good command of Korean in various daily conversational situations. *Prerequisites: LTKO 1CN or 1CH or placement test for 2A; 2A is prerequisite for 2B; 2B for 2C.*

LTKO 3. Advanced Korean: Third Year (5)
This course will help students develop advanced-level skills in the Korean language. Upon completion of this course, students are expected to have good command of Korean in various formal settings and to understand daily news broadcasts/newspapers. *Prerequisites: LTKO 2C or placement test and consent of instructor.*

LTKO 50. Intermediate Readings and Composition (4)
Designed to enhance reading and writing skills. We will read and discuss a variety of materials, including newspaper and magazine articles, short essays, and prose fiction. Writing exercises will stress improving students' ability to express themselves as well as their critical responses to reading. *Prerequisites: LTKO 2C and/or recommendation of instructor.*

LTKO 100. Readings in Korean Literature and Culture (4)
Majors issues in modern Korean history from colonial period to present, such as Japanese colonization, division, U.S./Soviet occupation, the Korean War, and authoritarian rule, industrialization, labor/agrarian movement and cultural/social issues, emerging within the globalized economy in South Korea. *Prerequisites: reading knowledge of Korean (two years college-level Korean or equivalent); upper-division standing.*

LATIN LITERATURE

(See also listings under Classical Studies)

LOWER-DIVISION

LTLA 1. Beginning Latin (4)
Study of Latin, including grammar and reading.

LTLA 2. Intermediate Latin (I) (4)
Study of Latin, including grammar and reading. *Prerequisite: LTLA 1 or its equivalent.*

LTLA 3. Intermediate Latin (II) (4)
Study of Latin, including grammar and reading. *Prerequisite: LTLA 2 or its equivalent.*

LTLA 4. Intensive Elementary Latin (12)
Equivalent of LTLA 1, 2, and 3. Given in summer session only.

UPPER-DIVISION

Prerequisite: upper-division standing or consent of instructor. Additional prerequisites may be specified below.

LTLA 100. Introduction to Latin Literature (4)
Reading and discussion of selections from representative authors of the Augustan age. Review of grammar as needed. *Prerequisite: LTLA 3 or equivalent.*

LTLA 101. Latin Composition (4)
Latin prose composition. *Prerequisites: completion of LTLA 100. Student must be concurrently enrolled in upper-division Literature/Latin course numbered 111 or above.*

LTLA 111. Pre-Augustan (4)
Readings, in Latin, in the works of Roman writers of the pre-Augustan period. May be repeated for credit as topics vary.

LTLA 114. Vergil (4)
Readings from the works of Vergil. Repeatable for credit when texts and material vary.

LTLA 116. Silver Latin (4)
Readings, in Latin, in the works of Roman writers of the Silver Age. May be repeated for credit as topics vary.

LTLA 131. Prose (4)
Readings, in Latin, of the work of Roman prose writers. May be repeated for credit as topics vary.

LTLA 132. Lyric and Elegiac Poetry (4)
Readings, in Latin, in the works of lyric and elegiac poets. May be repeated for credit as topics vary.

LTLA 133. Epic (4)
Readings in Latin in the works of the Roman epic poets. *Prerequisites: LTLA 1, 2, 3 or its equivalent.*

LTLA 134. History (4)
Readings, in Latin, in the works of Roman historians. May be repeated for credit as topics vary.

LTLA 135. Drama (4)
Readings, in Latin, in the works of Roman dramatists. *Prerequisite: LTLA 3 or equivalent; LTLA 100 recommended.* Repeatable for credit when topics vary.

LTLA 198. Directed Group Study (4)
Directed group study in areas of Latin literature not normally covered in courses. May be repeated three times. (P/NP grades only.) *Prerequisites: upper-division standing and permission of department.*

LTLA 199. Special Studies (2 or 4)
Tutorial; individual guided reading in areas of Latin literature not normally covered in courses. May be repeated for credit three times. (P/NP grades only.) *Prerequisites: upper-division standing and permission of department.*

GRADUATE

LTLA 297. Directed Studies (1-12)
Guided and supervised reading in a broad area of Latin literature. Offered for repeated registration.

LTLA 298. Special Projects (4)
Treatment of a special topic in Latin literature. Offered for repeated registration.

RUSSIAN LITERATURE

LOWER-DIVISION

LTRU 1A-B-C. First-Year Russian (5-5-5)
First-year Russian, with attention to reading, writing, and speaking.

LTRU 1AB and 1BC. Intensive Beginning Russian (7.5-7.5)
Intensive study of beginning Russian. Covers material of first-year Russian in two quarters. Development of all facets of language proficiency—speaking, listening, reading, writing. Attention given to cultural materials as well.

LTRU 2A-B-C. Second-Year Russian (5-5-5)
Second-year Russian grammar, with attention to reading, writing, and speaking. *Prerequisite: LIRU 33/53, LTRU 1A-B-C or equivalent.*

UPPER-DIVISION

Prerequisite: upper-division standing or consent of instructor. Additional prerequisites may be specified below.

Note: Many Russian literature courses are cross-listed as courses in European and Eurasian Literatures (LTEU). Lectures and discussions are conducted in English, and students may choose whether to do the reading and writing assignments in translation, in which case they should enroll for the course under its LTEU rubric, or in Russian, in which case they should enroll under the LTRU rubric. Other courses are offered in English translation with one-unit Foreign Language Discussion Sections (XL course number suffix) for students who wish to read and discuss some or all of assignments in Russian.

LTRU 104A-B-C. Advanced Practicum in Russian (4-4-4)
Development of advanced skills in reading, writing, and conversation. Course based on written and oral texts of various genres and styles. Individualized program to meet specific student needs. *Prerequisite for 104A: LTRU 2C or equivalent.*

LTRU 110A-B-C. Survey of Russian and Soviet Literature in Translation, 1800–Present (4-4-4)
A study of literary works from Pushkin to the present. LTRU 110A is not a prerequisite for LTRU 110B, and LTRU 110B is not a prerequisite for LTRU 110C.

110A. 1800–1860
110B. 1860–1917
110C. 1917–present

LTRU 123. Single Author in Russian Literature (4)
Study of the works of a single Russian author. May be repeated for credit two times. *Prerequisite: LTRU 101C, its equivalent, or permission of instructor.*

LTRU 129. Twentieth-Century Russian or Soviet Literature (4)
A study of literary works from the twentieth century. May be repeated for credit as topics vary. *Prerequisite: upper-division standing or consent of instructor.*

LTRU 150. Russian Culture (4)
An introduction to Russia's past and present through the cross-disciplinary study of literature, the visual and performing arts, social and political thought, civic rituals, popular entertainments, values and practices from 1825 to the present. *Prerequisite: upper-division standing.*

LTRU 150XL. Russian Culture: The Modern Period—Foreign Language Discussion Section (1)
Students will exercise advanced Russian language skills to read and discuss materials in LTRU 150. This section is taught by the course professor, has no final examination, and does not affect the student's grade in the parent course. *Prerequisites: co-registration in LTRU 150; four quarters of Russian language study or the equivalent.*

LTRU 198. Directed Group Study (4)
Directed group study in areas of Russian literature not normally covered in courses. May be repeated for credit three times. (P/NP grades only.) *Prerequisites: upper-division standing and permission of department.*

LTRU 199. Special Studies (2 or 4)
Tutorial; individual guided reading in areas of Russian literature not normally covered in courses. May be repeated for credit three times. (P/NP grades only.) *Prerequisites: upper-division standing and permission of department.*

LITERATURES IN SPANISH

LOWER-DIVISION

Language and Literature Courses

Students entering the Spanish language/literature program must have completed one year of college-level Spanish (Linguistics/Spanish 1C/1CX) or its equivalent at another institution or have the consent of the instructor. Ordinarily, students take LTSP 2A, 2B, 2C, and one or more courses from the 50 sequence. Native speakers are encouraged to take LTSP 2D.

LTSP 2A. Intermediate Spanish I: Foundations (5)
Course is taught in Spanish, emphasizing the development of reading ability, listening comprehension, and writing skills. It includes grammar review, weekly compositions, and class discussions. Successful completion of LTSP 2A satisfies the requirement for language proficiency in Revelle College. *Prerequisites: completion of LTSP 1C/1CX, 1D/DX, or the equivalent score of 3 on AP Spanish language exam, or instructor consent.*

LTSP 2B. Intermediate Spanish II: Readings and Composition (5)
Review of major points of grammar with emphasis on critical reading and interpretation of Spanish texts through class discussions, vocabulary development, and written compositions. It is a continuation of LTSP 2A. *Prerequisites: LTSP 2A or score of 4 on AP Spanish language or 3 on AP Spanish literature exams or consent of instructor.*

LTSP 2C. Intermediate Spanish III: Cultural Topics and Composition (4)
Continuation of LTSP 2B, with special emphasis in writing and translation. It includes discussion of cultural topics as well as grammar review and composition, further developing the ability to read articles, essays, and longer pieces of fiction/nonfictional texts. *Prerequisites: LTSP 2B or equivalent or score of 5 on AP Spanish language or 4 on AP Spanish literature exams or consent of instructor.*

LTSP 2D. Intermediate/Advanced Spanish: Spanish for Bilingual Speakers (4)
Spanish for native speakers. Designed for bilingual students seeking to become biliterate. Reading and writing skills stressed with special emphasis on improvement of written expression and problems of grammar and orthography. Prepares native speakers with little or no formal training in Spanish for more advanced courses. *Prerequisite: native speaking ability and/or recommendation of instructor.*

LTSP 2E. Advanced Readings and Composition for Bilingual Speakers (4)
Second course in a sequence designed for bilingual students seeking to become bi-literate. Special emphasis given to improvement of written expression, grammar, and orthography. Prepares bilingual students with little or no formal training in Spanish for more advanced course work. *Prerequisites: LTSP 2D native Spanish speaking ability and/or recommendation of instructor.*

LTSP 21. Conversation Workshop I (1)
Allows students with a basic grounding in Spanish to discuss a variety of topics related to literary and cultural issues. Vocabulary development, use of idiomatic expression, and advancement of oral proficiency in Spanish. May be taken as an adjunct to lower-division LTSP courses. Recommended for students planning to sutdy abroad. *Prerequisite: LISP IC/ICX or LTSP ID/IDX or LTSP 2A or 2B or 2C or 2D or 50A or 50B or 50C.*

LTSP 31. Conversation Workshop II (1)
Enhances intermediate/advanced students' command of spoken Spanish through debates on literary and cultural issues and the formulation and expression of thoughts in Spanish. May be taken as an adjunct to lower- and upper-division LTSP courses. Recommended for students planning to study abroad. *Prerequisite: LISP IC/ICX or LISP ID/IDX or LTSP 2A or 2B or 2C or 2D or 50A or 50B or 50C.*

LTSP 41. Conversation and Orthography Workshop (1)
The workshop format of this course allows students to attain a stronger command of skills in matters of Spanish orthography, spelling, punctuation, and accent rules. May be taken as an adjunct to lower- or upper-division LTSP courses. Recommended for students planning to study abroad. *Prerequisite: LISP IC/ICX or LISP ID/IDX or LTSP 2A or 2B or 2C or 2D or 50A or 50B or 50C.*

LTSP 50A. Readings in Peninsular Literature (4)
An introduction to Peninsular literature, this course offers a selection of major works and introduces students to literary analysis through reading extensive texts in Spanish. Two or more quarters of courses in

the 50 series are suggested before students proceed to upper-division courses. *Prerequisite: two years of college Spanish or the equivalent.*

LTSP 50B. Readings in Latin American Literature (4)
An introduction to Latin American literature, this course offers a selection of major works and introduces students to literary analysis through reading extensive texts in Spanish. Two or more quarters of courses in the 50 series are suggested before students proceed to upper-division courses. *Prerequisite: two years of college Spanish or the equivalent.*

LTSP 50C. Readings in Latin American Topics (4)
An introduction to major topics in Latin American literature, this course focuses on the literature of a particular region, period, or movement. Works vary from those in 50B and introduce students to literary analysis through reading extensive texts in Spanish. *Prerequisite: two years of college Spanish or the equivalent.*

LTSP 87. Freshman Seminar (1)
The Freshman Seminar Program is designed to provide new students with the opportunity to explore an intellectual topic with a faculty member in a small seminar setting. Freshman seminars are offered in all campus departments and undergraduate colleges, and topics vary from quarter to quarter. Enrollment is limited to fifteen to twenty students, with preference given to entering freshmen.

UPPER-DIVISION

Prerequisite: upper-division standing or consent of instructor. Additional prerequisites may be specified below.

Note: As of fall 1992, students must have taken at least one (but preferably two) course(s) in the LTSP 50A-B-C sequence with a grade of C– or better before enrolling in upper-division courses. Without fulfillment of this prerequisite, students must obtain the consent of the instructor of the requested course.

LTSP 100. Major Works of the Middle Ages (4)
Major Spanish literary works of the Middle Ages and Renaissance as seen against the historical and intellectual background of this period. *Prerequisites: upper-division standing, LTSP 50A, 50B, or 50C, or consent of instructor.*

LTSP 107. Literature of the Fifteenth Century (4)
Survey of cultural texts including courtly romances, political poetry, Columbus's letters, and the tragicomedia *La Celestina*. Issues of gender, blood purity, social estates, and colonialism will be discussed. Repeatable for credit when topics vary.

LTSP 116. Representations of Spanish Colonialism (4)
Analysis of selected materials that represent the cultural and political relationship between Spain and its colonies. Close reading of literary texts and historical documents. Specific periods covered will fall between the origins of empire in the early sixteenth century to the demise of imperial Spain in 1898; topics may include cultural exchanges between Spain and Latin America, the Philippines, or the U.S. Southwest. Repeatable for credit as topics vary.

LTSP 119AB. Cervantes: Teatro y Novelas (4)
Study of Cervantes's innovations in the short narrative form and theatrical production during the late sixteenth and early seventeenth centuries. Special attention to textual structures and ideological elements such as gender, religion, and early modern conceptions of ethnicity, "race," and nation. This course fulfills the requirement for Spanish literature majors.

LTSP 119C. Cervantes: Don Quixote (4)
Close reading of the 1605 and 1615 texts with special attention to the social and cultural background of the early 17th century in Spain. This course fulfills the requirement for Spanish literature majors. *Prerequisites: LTSP 50A and either 50B or 50C.*

LTSP 122. The Romantic Movement in Spain (4)
This course will explore the historical context of the emergence of a Romantic movement in Spain, particularly the links between Romanticism and liberalism. Major Romantic works in several genres will be studied in depth. *Prerequisite: upper-division standing or consent of instructor.*

LTSP 123. Topics in Modern Spanish Culture (4)
Investigation of selected topics concerning Spanish cultural production after 1800. Topics might focus on a genre (film, popular novel, theater) or on the transformations of a theme or metaphor (nation, femininity, the uncanny). Repeatable for credit as topics vary.

LTSP 125 Spanish Modernisms (4)
Analysis and discussion of forms, movements, and issues arising in Spanish culture between 1898 and 1936 in relation to the loss of empire, accelerating modernization and new social movements. Repeatable for credit as topics vary.

LTSP 129. Spanish Writing after 1939 (4)
Analysis and discussion of literary production during and after the Franco dictatorship. May focus on specific genres, sub-period, or issues. Repeatable for credit as topics vary.

LTSP 130A. Development of Spanish Literature (4)
An introduction to the major movements and periods of Spanish literary history, centered on close reading of representative texts, but aimed at providing a sense of the scope of Spanish literature and its relation to the course of Spain's cultural and social history. This course is required of all Spanish literature majors. It is strongly recommended that this course be taken before any other upper-division Spanish (peninsular) literature course. *Prerequsites: LTSP 50A and either 50B or 50C.*

LTSP 130B. Development of Latin American Literature (4)
An introduction to major movements and periods in Latin American literature, centered on a study of key works from pre-Columbian to the present time. Texts will be seen within their sociohistorical context and in relation to main artistic trends of the period. This course is required of all Spanish literature majors. It is strongly recommended that this course be taken before any other upper-division Latin American literature course. *Prerequisites: LTSP 50A and either 50B or 50C.*

LTSP 133. Contemporary Latin American Literature (4)
A study of the major literary works and problems in Latin America from 1900 to the present as seen against the historical context of the period. Repeatable for credit as topics vary.

LTSP 134. Literature of the Southern Cone (4)
Study of movements, traditions, key authors, or major trends in Argentine, Paraguayan, Uruguayan, and Chilean literatures, including gaucho poetry, the realist novel, modern urban narratives, the Borges School, etc. Repeatable for credit as topics vary.

LTSP 135A. Mexican Literature before 1910 (4)
Explores the relationships among cultural production, politics, and societal changes in Mexico before the 1910 Revolution, specifically the roles of intellectuals and popular culture in nation-building and modernization. Readings may include didactic literature and historiographic writings, forms of popular discourse, as well as novels and poetry. Repeatable for credit as topics vary.

LTSP 135B. Modern Mexican Literature (4)
Study of popular novels, movements, traditions, key authors, or major trends in modern Mexican literature. May be repeated for credit as topics vary.

LTSP 136. Andean Literatures (4)
Study of movements, traditions, key authors, or major trends in Peruvian, Ecuadorian, and Bolivian literatures, such as indigenismo, urban narrative, and the works of authors such as Vallejo, Icaza, Arguedas, Vargas Llosa. Repeatable for credit as topics vary.

LTSP 137. Caribbean Literature (4)
Study of movements, traditions, key authors, or major trends in Caribbean literature in Spanish, such as the romantic movement, the literature of independence, the essay tradition, Afro-Antillean literature, the historical novel. May be repeated for credit as topics vary.

LTSP 138. Central American Literature (4)
Study of movements, traditions, key authors, or major trends in the literatures of Guatemala, El Salvador, Nicaragua, Honduras, Costa Rica, and Panama, such as the anti-imperialist novel, indigenismo, guerrilla poetry, and testimonio. Repeatable for credit as topics vary.

LTSP 140. Latin American Novel (4)
A study in depth of selected novelists of Spanish America. May be organized around a specific theme or idea which is traced in its development through the narratives. Course may be repeated for credit when topics vary.

LTSP 141. Latin American Poetry (4)
A critical study of some of the major poets of Spanish America, focusing on the poet's central themes, the evolution of poetic style, and the significance of the poetry to the historical context. May be repeated as topics vary.

LTSP 142. Latin American Short Story (4)
Readings and interpretation of short story form in Latin America. Focus is primarily nineteenth or twentieth century. May be repeated for credit as topics vary.

LTSP 150B. Contemporary Chicano/a-Latino/a Cultural Production: 1960 to Present (4)
Cross-disciplinary study of late twentieth-century Latino/a-Chicano/a literature, the visual and performing arts, film, or other cultural practices. Specific periods covered will fall between the Kennedy years to the era of neoliberalism and the creation of "Hispanic" or Latino identities. Repeatable for credit as topics vary.

LTSP 151. Topics in Chicano/a-Latino/a Cultures (4)
Cross-disciplinary study of late twentieth-century Chicano/a-Latino/a literature, the visual and performing arts, film, or other cultural practices. Representative areas of study are social movements, revolution, immigration, globalization, gender and sexuality, cultures of the U.S.-Mexico border, and Chicano/a-Mexicano/a literary relations. Repeatable for credit as topics vary.

LTSP 153. Chicano/a and Latino/a Poetry (4)
A study of themes and issues in the poetic production of Latino communities in the U.S. Every effort will be made to select texts in Spanish but some may be bilingual. Repeatable for credit as topics vary.

LTSP 154. Latino/a and Chicano/a Literature (4)
This course will study the representation of a variety of social issues (immigration, racism, class differences, violence, inter/intra-ethnic relations, etc.) in works written in Spanish by Latino/a and Chicano/a writers. Repeatable for credit as topics, texts, and historical periods vary.

LTSP 160. Spanish Phonetics (4)
A comparative study of the English and Spanish phonetic systems. Includes a study of the organs of articulation, manner of articulation stress and intonation patterns, as well as dialectal variations of Spanish. *Prerequisites: upper-division standing, LTSP 50A-B-C, or consent of instructor.*

LTSP 162. Spanish Language in the United States (4)
A sociolinguistic study of the popular dialects in the U.S.A. and their relation to other Latin American dialects. The course will cover phonological and syntactic differences between the dialects as well as the influence of English on the Southwest dialects.

LTSP 164. Language and Society (4)
A comparison of language policies in Latin America and that of other Third World countries and its reflection in literature. *Prerequisites: upper-division standing, LTSP 50A-B-C, or consent of instructor.*

LTSP 165. History of the Spanish Language (4)
Course traces the development of the Spanish language from Vulgar Latin to modern Spanish and focuses on phonological, morphological and syntactic changes across time and space. Texts from various periods/regions of Spain and Latin America will be used. *Prerequisites: upper-division standing, LTSP 50A-B-C, or consent of instructor.*

LTSP 166. Creative Writing (4)
A workshop designed to foster and encourage writing in Spanish of students working on short forms of fiction. The workshop will include discussions of techniques and intensive writing. *Prerequisites: completion of LTSP 50A-B-C, upper-division standing, or consent of instructor.*

LTSP 170. Contemporary Theories of Cultural Production (4)
Selected readings in recent cultural and literary theory. Students will be exposed to a variety of methodologies drawn from the Latin American, European, and U.S. traditions. Final project consists of a practical "application" of a method or methods to a specific cultural object. This course is recommended for students who plan to pursue graduate work in literature.

LTSP 172. Indigenista Themes in Latin American Literature (4)
Study of the literary modes by which nineteenth and twentieth century authors have interpreted the themes of indigenous survival and resistance in Latin America, primarily in Mexico and the Andean region. Repeatable for credit as topics vary.

LTSP 173. Problems in Spanish and Latin American Literary History (4)
Study of the issues involved in understanding the development process of literary expression; the problem of genre; the relation of literature to social institutions; the function of literary influence and tradition; the relation of popular and print cultures. May be repeated for credit as topics vary.

LTSP 174. Topics in Culture and Politics (4)
Study of the relationships between cultural production (literature, film, popular cultures), social change, and political conflict, covering topics such as colonialism, imperialism, modernization, social movements, dictatorship, revolution. Repeatable for credit as topics vary.

LTSP 175. Gender, Sexuality, and Culture (4)
This course will examine issues of gender, sexuality, and culture in Spanish, Latin American, and/or Chicana/o literatures. Repeatable for credit as topics, texts, and historical periods vary.

LTSP 176. Literature and Nation (4)
Study of literature as a means through which the nation has been imagined and as a site of debates over national identity and citizenship. Course materials may focus on Spain and/or Latin America. Repeatable for credit as topics vary.

LTSP 177. Literary and Historical Migrations (4)
This course will focus on a variety of Latin American and/or Spanish intra- and inter-national migrations throughout the world and on the literature produced by these exiles or immigrants. Repeatable for credit as topics, texts, and historical periods vary.

LTSP 190. Seminars (4)
These seminars are devoted to a variety of special topics, including the works of single authors, genre studies, problems of literary history, relations between literature and the history of ideas, literary criticism, literature and society, and the like. The student may enroll in more than one seminar in a single quarter.

LTSP 196. Honors Thesis (4)
Senior thesis research and writing for students who have been accepted for the Literature Honors Program and who have completed LTGN 191. Oral Exam.

LTSP 198. Directed Group Study in Spanish Literature (4)
Research seminars and research, under the direction of a member of the staff. May be repeated for credit three times. (P/NP grades only.) *Prerequisites: upper-division standing and permission of department.*

LTSP 199. Special Studies (2 or 4)
Tutorial: individual guided reading in areas of Spanish literature not normally covered in courses. May be repeated for credit three times. (P/NP grades only.) *Prerequisites: upper-division standing and permission of department.*

GRADUATE

LTSP 224. Golden Age Studies (4)
Consideration of one or more major figures, texts, trends, or problems in Spanish Golden Age studies. May be repeated for credit as topics vary.

LTSP 252. Studies in Modern Hispanic Literature and Culture (4)
Major trends and figures considered in the context of late nineteenth-and twentieth-century Hispanic culture. May be repeated for credit as topics vary.

LTSP 258. Spanish American Prose (4)
Consideration of one or more major figures, texts, trends, or problems in Spanish American prose. May be repeated for credit as topics vary.

LTSP 272. Literature and Society Studies (4)
Special topics in practical criticism involving social and economic historical perspectives. May be repeated for credit as topics vary.

LTSP 275. Latin American(ist) Literary and Cultural Theories Since the 1960s (4)
A historical survey of late twentieth-century literary and cultural criticism in and about Latin America, focusing on questions of political economy and periodization, cultural heterogeneity and transculturation, gender and sexuality, and the relationships between literary, popular, and mass cultures. *Prerequisite: graduate standing.*

LTSP 295. M.A. Thesis (1-8)
Research for the master's thesis. Open for repeated registration up to eight units. (S/U grades only.)

LTSP 296. Research Practicum (1-12)
Research project to be developed by a small group of students under the continued direction of individual faculty members. Primarily a continuation of a previous graduate seminar. The 296 courses do not count toward the seminar requirement. Repeatable for credit.

LTSP 297. Directed Studies: Reading Course (1-12)
This course may be designed according to an individual student's needs when seminar offerings do not cover subjects, genres, or authors of interest. No paper required. The 297 courses do not count toward the seminar requirement. Repeatable for credit.

LTSP 298. Special Projects: Writing Course (1-12)
Similar to a 297, but a paper is required. Papers are usually on subjects not covered by seminar offerings. Up to two 298s may be applied toward the twelve-seminar requirement of the doctoral program. Repeatable for credit.

LTSP 299. Dissertation (1-12)
Research for the dissertation. Offered for repeated registration. Open only to Ph.D. students who have advanced to candidacy.

LITERATURE/THEORY

Courses in theory may apply to various literature majors. Please consult your adviser.

Additional theory courses are offered in the various department sections. See quarterly course descriptions in the Department of Literature office, first floor LIT building.

UPPER-DIVISION

Prerequisite: upper-division standing or consent of instructor. Additional prerequisites may be specified below.

LTTH 110. History of Criticism (4)
A critical and interpretive review of some of the major documents in criticism from the classical period to the present time.

LTTH 115. Introduction to Critical Theory (4)
(Formerly LTTH 100) A critical review of major contemporary theories of the nature of literature, its sociocultural function, and appropriate modes of evaluation.

LTTH 130. Introduction to Linguistic and Discourse Theories (4)
An introduction to linguistic and discourse theories, analyses of linguistic structures, elements of sociolinguistics, language use, language acquisition, and bilingualism.

LTTH 150. Topics in Critical Theory (4)
Selected topics in critical theory such as: a particular mode of literary theory; comparative study of theories of text and image; a problem or theme in the history of theory; issues involved in the relationship between fiction and other discourses (science, law, history, philosophy, music). Repeatable for credit when topics vary. *Prerequisite: upper-division standing or consent of instructor.*

LTTH 198. Directed Group Study (4)
Directed group study, under the guidance of a member of the faculty, in an area not covered in courses currently offered by the department (P/NP only)

LTTH 199. Special Studies (2 or 4)
Individual reading in an area not covered in courses currently offered by the department. (P/NP only).

GRADUATE

LTTH 200A. Text/Culture/Critical Practice (4)
An introduction to theories and practices of literary and cultural criticism. Topics may vary, but emphasis will be on terminology, methods of readings, modes of interdisciplinary analysis and argumentation, recent debates on questions of theory, history, textual scholarships, etc. *Prerequisite: registered doctoral student in literature.*

LTTH 200B. Problems in Contemporary Literary Theory (4)
The focus is feminist literary/cultural theories and their relations with major contemporary theoretical discourses (e.g., psychoanalysis, poststructuralism, and various forms of historicism). *Prerequisite: registered doctoral student in literature.*

LTTH 200C. Cultural Perspectives and Cultural Criticism (4)
Literary and cultural relations between the First and Third Worlds, colonialism and neo-colonialism, orality and literacy, construction of ethnicity, formation of canon, and popular culture and the market. *Prerequisite: registered doctoral student in literature.*

LTTH 201. Contemporary Theoretical Debates and Critical Discourses (4)
An introduction to a wide range of theoretical and methodological issues, schools of thought, and interpretative styles in contemporary literary studies. Required of all M.A. students in the Department of Literature, normally in their first quarter in the program. *Prerequisites: admission to the M.A. program in the Department of Literature or consent of instructor; graduate standing.*

LTTH 210. Major Periods and Movements (4)
Historically oriented study of past criticism and critical theory as they pertain to contemporary interests and concerns. May be repeated for credit when topics vary.

LTTH 220. Theories of Literary Criticism (4)
Close study of any of the several bodies of literary theory currently applied to literary criticism: psychoanalytic, Marxist, historicist, semiotic, feminist, hermeneutic, reader-response, among others. May be repeated for credit when topics vary.

LTTH 230. Comparative Literary Theory (4)
Comparison of theoretical approaches across cultures (e.g., East/West studies), across modes of discourse (e.g., oral/written), or across media (e.g., literature/art or literature/music). May be repeated for credit when topics vary.

LTTH 296. Research Practicum (1-12)
Research project to be developed by a small group of students under the continued direction of individual faculty members. Primarily a continuation of a previous graduate seminar. The 296 courses do not count toward the seminar requirement. Repeatable for credit.

LTTH 297. Directed Studies: Reading Course (1-12)
This course may be designed according to an individual student's needs when seminar offerings do not cover subjects, genres, or authors of interest. No paper required. The 297 courses do not count toward the seminar requirement. Repeatable for credit.

LTTH 298. Special Projects: Writing Course (1-12)
Similar to a 297, but a paper is required. Papers are usually on subjects not covered by seminar offerings. Up to two 298s may be applied toward the twelve-seminar requirement of the doctoral program. Repeatable for credit.

LITERATURES OF THE WORLD

AFRICAN LITERATURES

Prerequisite: upper-division standing or consent of instructor. Additional prerequisites may be specified below.

LTAF 110. African Oral Literature (4)
Survey of various genres of African and oral literary traditions. Oral narrative genres, investigation of proverb, riddle, praise poetry, and epic. Development and use of a methodology to analyze aspects of performance, composition, and education in oral traditional systems.

LTAF 120. Literature and Film of Modern Africa (4)
This course traces the rise of modern literature in traditional African societies disrupted by the colonial and neocolonial experience. Contemporary films by African and Western artists will provide an additional insight into the complex social self-images of the continent.

LITERATURES OF THE AMERICAS

Prerequisite: upper-division standing or consent of instructor. Additional prerequisites may be specified below.

Foreign language discussion sections (XLs) may be offered in conjunction with courses taught in translation. Students enrolled in these joint courses may use them to fulfill major, minor, and secondary literature requirements. Please see the undergraduate office for further information.

LTAM 87. Freshman Seminar (1)
The Freshman Seminar Program is designed to provide new students with the opportunity to explore an intellectual topic with a faculty member in a small seminar setting. Freshman seminars are offered in all campus departments and undergraduate colleges, and topics vary from quarter to quarter. Enrollment is limited to fifteen to twenty students, with preference given to entering freshmen.

LTAM 100. Latino/a Cultures in the United States (4)
An introductory historical and cultural overview of the various Latino/a populations in the U.S. with a study of representative cultural texts.

LTAM 101. Early Latino/a-Chicano/a Cultures: 1848–1960 (4)
A cross-disciplinary study of nineteenth- and early twentieth-century Latino/a-Chicano/a literature, the visual and performing arts, and other cultural practices. May be repeated for credit as topics vary.

LTAM 102. Contemporary Chicano/a-Latino/a Cultural Production: 1960 to Present (4)
A cross-disciplinary study of late twentieth-century Latino/a-Chicano/a literature, the visual and performing arts, and other cultural practices. May be repeated for credit as topics vary.

LTAM 105. Gender and Sexuality in Latino/a Cultural Production (4)
A study of the construction of differences in gender and sexual orientation in Latino/a-Chicano/a literature and other cultural production with an emphasis on examining various theoretical/ideological perspectives on these issues. May be repeated for credit as topics vary.

LTAM 106. Modern Chicana and Mexican Women Writings (4)
A study of themes and issues in the writings of Chicana and Mexican women with a view toward establishing connections while recognizing national and cultural differences between the two. May be repeated for credit as topics vary.

LTAM 107. Comparative Latino/a and U.S. Ethnic Cultures (4)
A comparative and intersecting study of Latino/a and other U.S. ethnic cultures. Literary texts will be viewed as "windows" into real time and spaces where cultures meet and mix. May be repeated for credit as topics vary.

LTAM 108. Chicano/a and Latino/a Cultures: Intellectual and Political Traditions (4)
The course will center on Chicano/a-Latino/a writers and movements of literary, intellectual, cultural, or political significance. Texts may be read in the original language or in English. May be repeated for credit as topics vary.

LTAM 109. Cultural Production of the Latino/a Diasporas (4)
A study of the cultural production of Latino/a immigrant groups with a focus on the literary representation of homeland, national culture, and the forces that led to migration. May be repeated for credit as topics vary.

LTAM 110. Latin American Literature in Translation (4)
Reading of representative works in Latin American literature with a view to literary analysis (form, theme, meaning), the developmental processes of the literature, and the many contexts: historical, social, cultural. Texts may be read in English. May be repeated for credit as topics vary.

LTAM 111. Latin American Literature in Translation (4)
Comparative survey of Caribbean literatures from the Spanish, French, English, and Dutch Caribbean. Literary texts trace historical paradigms including the development of plantation slavery, emancipation, the quest for nationhood, migration, and transnational identities. Films and music may complement discussion. *Prerequisite: upper-division standing.*

LTAM 120. Mexican Literature in Translation (4)
Study of popular novels, movements, traditions, key authors, or major trends in modern Mexican literature. Texts may be read in English. May be repeated for credit as topics vary.

LTAM 130. Reading North by South (4)
An analysis of the readings and appropriations of European and U.S. traditions by Latin American, Caribbean, and Filipino writers. The course addresses philosophies, ideologies, and cultural movements and explores the specific literary strategies used by authors in constructing their paricular "cosmovisión".

LTAM 132. The Dark Side of Enlightenment in Spain, the Americas, and the Philippines (4)
This course deals with the cultural production of Spain, the Philippines, Latin America, and the U.S. to examine views (both optimistic and pessimistic) on the Enlightenment as a mode of conducting scientific investigation of nature, constituting forms of government, and imagining the future. May be repeated for credit as topics vary.

EAST ASIAN LITERATURES

Prerequisite: upper-division standing or consent of instructor. Additional prerequisites may be specified below.

Foreign language discussion sections (XLs) may be offered in conjunction with courses taught in translation. Students enrolled in these joint courses may use them to fulfill major, minor, and secondary literature requirements. Please see the undergraduate office for further information.

LTEA 100A. Classical Chinese Poetry in Translation (4)
A survey of different genres of traditional Chinese poetry from various periods.

LTEA 100B. Modern Chinese Poetry in Translation (4)
A survey of Chinese poetry written in the vernacular from 1918 to 1949.

LTEA 100C. Contemporary Chinese Poetry in Translation (4)
A survey of Chinese poetry development from 1949 to the present.

LTEA 110A. Classical Chinese Fiction in Translation (4)
The course will focus on a few representative masterpieces of Chinese literature in its classical age, with emphasis on the formal conventions and the social or intellectual presuppositions that are indispensable to their understanding. May be repeated for credit when topics vary.

LTEA 110B. Modern Chinese Fiction in Translation (4)
A survey of representative works of the modern period from 1919 to 1949. May be repeated for credit when topics vary.

LTEA 110C. Contemporary Chinese Fiction in Translation (4)
An introductory survey of representative texts produced after 1949, with particular emphasis on the social, cultural, and political changes. May be repeated for credit when topics vary.

LTEA 120A. Chinese Films (4)
A survey of representative films from different periods of Chinese cinematic development. Priority may be given to Chinese Studies majors and Literature majors. Repeatable for credit when topics vary.

LTEA 120B. Taiwan Films (4)
A survey of "New Taiwan Cinema" of the Eighties and Nineties. Priority may be given to Chinese Studies majors and Literature majors. Repeatable for credit when topics vary.

LTEA 120C. Hong Kong Films (4)
An examination of representative works of different film genres from Hong Kong. Priority may be given to Chinese Studies majors and Literature majors. Repeatable for credit when topics vary.

LTEA 120D. Filming Chinese Literature (4)
An investigation of various adaptations of both traditional and modern literary texts from the three main Chinese communities (China, Taiwan, and Hong Kong). Priority may be given to Chinese Studies majors and Literature majors. Repeatable for credit when topics vary.

LTEA 130. Earlier Japanese Literature in Translation (4)
An introduction to earlier Japanese (bungo) literature in translation. Will focus on several works, placing their forms in the historical context. No knowledge of Japanese required. Repeatable for credit when topics vary.

LTEA 132. Later Japanese Literature in Translation (4)
An introduction to later Japanese (kogo) literature in translation. Will focus on several "modern" works, placing their form in the historical context. No knowledge of Japanese required. Repeatable for credit when topics vary.

LTEA 136. Special Topics in Japanese Literature (4)
The course will focus on important problematics of literary studies as they relate to Japan (e.g., "feminism," "modernity," "literary mode of production," "Orientalism and nativism"). No knowledge of Japanese required. May be repeated for credit as topics vary.

LTEA 140. Modern Korean Literature in Translation from Colonial Period (4)
A survey of modern Korean prose fiction and poetry from the colonial period. Exploration of major issues such as Japanese colonization, rise of left-wing and right-wing nationalisms, construction of national culture, and relations between tradition and modernity.

LTEA 141. Modern Korean Literature in Translation from 1945 to the Present (4)
A survey of modern Korean prose fiction and poetry from 1945 to the 1990s. Examination of literary representations of national division, the Korean War, accelerated industrialization, authoritarian rule, and the labor/agrarian movements.

LTEA 142. Korean Film, Literature, and Popular Culture (4)
A study of modern Korean society and its major historical issues as represented in film, literature, and other popular cultural media such as TV and music video. We will explore additional issues such as cinematic adaptations of prose fiction, fluid distinctions between popular literature and "serious" literature, and the role of mass media under authoritarian rule.

LTEA 143. Gender and Sexuality in Korean Literature and Culture (4)
A study of constructions of gender and sexuality in pre-modern and modern Korean societies. We will discuss literary works as well as historical and ethnographic works on gender relations, representations of masculinity and femininity, and changing roles of men and women in work and family.

LTEA 144. Korean American Literature and Other Literatures of Korean Diaspora (4)
An examination of the experiences of the Korean diaspora linked to the historical contexts of modern Korea, Japan, the United States, and other countries. We will focus on literature both about Korea and the Korean immigrant experience written in the United States but will also read from and about other Korean diasporic contexts.

LTEA 145. Literature, History, and Colonial and Postcolonial Modernity in Korea (4)
Comparative examination of historiographical and literary representations of major issues such as nationalism, industrialization, class division, gender, and sexuality. Literary re-writings of modern Korean history and recent revisionist historiographical works and trends. *Prerequisite: upper-division standing.*

LTEA 198. Directed Group Study (4)
Research seminars and research, under the direction of a faculty member.

LTEA 199. Special Studies (2 or 4)
Tutorial; individual guided reading in areas not normally covered in courses. (P/NP grades only.)

EUROPEAN AND EURASIAN LITERATURES

Prerequisite: upper-division standing or consent of instructor. Additional prerequisites may be specified below.

Foreign language discussion sections (XLs) may be offered in conjunction with courses taught in translation. Students enrolled in these joint courses may use them to fulfill major, minor, and secondary literature requirements. Please see the undergraduate office for further information.

LTEU 87. Freshman Seminar (1)
The Freshman Seminar Program is designed to provide new students with the opportunity to explore an intellectual topic with a faculty member in a small seminar setting. Freshman seminars are offered in all campus departments and undergraduate colleges, and topics vary from quarter to quarter. Enrollment is limited to fifteen to twenty students, with preference given to entering freshmen. *No prerequisites.*

LTEU 102. Women in Antiquity (4)
Selected topics in classical culture including women and myth, women in Greek and Roman society, and the representation of women in classical literature. May be repeated for credit as topics vary.

LTEU 105. Medieval Studies (4)
Studies in medieval culture and thought with focus on one of the "three crowns" of Italian literature: Dante,

Boccaccio, or Petrarca. May be repeated for credit when course content varies.

LTEU 109. Studies in Eighteenth-Century European Literature (4)
Topics to be considered include the age of sensibility, enlightenment, neo-classicism. Attention given to historical and cultural contexts.

LTEU 110. European Romanticism (4)
Attention given to historical and cultural contexts. Topics to be considered include the concept of nature, the reaction to science, the role of the imagination. May be repeated for credit as topics vary.

LTEU 120. Literatures in French (4)
One or more periods or authors in French literature. Texts read in English. May be repeated for credit as topics vary.

LTEU 130. German Literature in Translation (4)
One or more aspects of German literature, such as major authors, the contemporary novel, nineteenth-century poetry, German expressionism. Texts may be read in English or the original language. May be repeated for credit as topics vary.

LTEU 138. Single Author in German Literature (4)
A study of literary works by a single German author. All readings will be in English, although when appropriate, a separate German language discussion section will be offered for students interested in reading and discussing the texts in German. *Prerequisite: upper-division standing.*

LTEU 139. Marx/Nietzsche/Freud (4)
Intensive examination of the major ideas of all three writers, with special attention to the literary styles and problematic aspects of their work. Often offered with an optional LTEU 139XL section, for students who are prepared to work and prefer to work in the original German.

LTEU 140. Italian Literature in Translation (4)
One or more periods or authors in Italian literature. Texts may be read in English. May be repeated for credit as topics vary.

LTEU 145. Studies in Modern Italian Poetry (4)
Study of the chief modern Italian poets, including Montale, Ungaretti, and Quasimodo, with attention to long, poetic form and contemporary Italian culture. *Prerequisite: upper-division standing.*

LTEU 146. Studies in Modern Italian Prose (4)
A study of the chief modern Italian *prosatori* including D'Annunzio, Calvino, Pavese, Pasolini, etc. Repeatable for credit. (Conjoined with LTIT 137.)

LTEU 147. Women in Italy (4)
A study of historical, political, and literary texts regarding women and feminism in Italian society.

LTEU 150A-B-C. Survey of Russian and Soviet Literature in Translation, 1800 to the Present
A study of literary works from Pushkin to the present.

150A. 1800–1860
150B. 1860–1917
150C. 1917–present

LTEU 153. Twentieth-Century Russian or Soviet Literature in Translation (4)
A study of literary work from the twentieth century. May be repeated for credit as topics vary.

LTEU 154. Russian Culture (4)
An introduction to Russia's past and present through the cross-disciplinary study of literature, the visual and performing arts, social and political thought, civic rituals, popular entertainments, values and practices from 1825 to the present. *Prerequisite: upper-division standing.*

LTEU 158. Single Author in Russian Literature in Translation (4)
A study of literary works by a single Russian author. All readings will be in English. May be repeated for credit when authors vary.

NEAR EASTERN LITERATURES

Prerequisite: upper-division standing or consent of instructor. Additional prerequisites may be specified below.

Foreign language discussion sections (XLs) may be offered in conjunction with courses taught in translation. Students enrolled in these joint courses may use them to fulfill major, minor, and secondary literature requirements. Please see the undergraduate office for further information.

LTNE 100. The Bible and Western Literature (4)
Biblical and related texts that influenced the great writers of the Middle Ages and Renaissance, including sections from the Jewish and Christian scriptures. *Prerequisite: upper-division standing or consent of instructor.*

LTNE 101. The Bible: The Narrative Books (4)
Examination of the Biblical accounts in their ancient Near Eastern context. Emphasis will be placed on literary- and form-criticism and textual analysis. Attention to related literature and to archaeological data; consideration of theological issues. Repeatable for credit as topics vary.

LTNE 102. The Bible: The Prophetic Books (4)
The prophetic books of the Bible in their historical contexts. The relationship between the prophetic and narrative books. Literary/critical analyis, theological issues, reference to archaeological data. Repeatable for credit as topics vary.

LTNE 103. The Bible: The Poetic Books (4)
Study of biblical peotry, its settings, genres, and themes. Analysis of metre and structure with particular attention to the use of parallel. Comparison with Canaanite and Mesopotamian examples. May be repeated for credit. *Prerequisite: upper-division standing.*

LTNE 120A. Topics in Early Christian Literature: The New Testament (4)
An introduction to the writings of the New Testament, their creation, collection, and critical study.

LTNE 120F. Topics in Early Christian Literature: Christianity and the Roman Empire (4)
An evaluation of significant attempts (from Edward Gibbon to Peter Brown) to explain the "rise" of Christianity and the "decline and fall" of the Roman Empire.

LITERATURES OF THE WORLD

In both lower- and upper-division world literature courses, texts may be read in English translation when necessary, and lectures and discussions are conducted in English.

Foreign language discussion sections (XLs) may be offered in conjunction with courses taught in translation. Students enrolled in these joint courses may use them to fulfill major, minor, and secondary literature requirements. Please see the undergraduate office for further information.

LOWER-DIVISION

LTWL 4A-B-C-D-F-M. Film and Fiction in Twentieth-Century Societies (4)
A study of modern culture and of the way it is expressed and understood in novels, stories, and films. The sequence aims at an understanding of relationship between the narrative arts and society in the twentieth century, with the individual quarters treating fiction and film of the following language groups. 4A French, 4B German, 4C Asian, 4D Italian, 4M multiple national literatures and film, 4F Spanish.

LTWL 19A-B-C. Introduction to the Ancient Greeks and Romans (4-4-4)
An introductory study of the Graeco-Roman world, its literature, myth, philosophy, history, and art.

LTWL 50. Introduction to Literary and Cultural Studies (4)
A preliminary survey of issues and problems raised by literary and cultural studies. Discussion will focus on basic terms in literary analysis (narrative, genre, character, poetics) and on rhetorical techniques for writing advanced expository papers in literary and cultural topics. It is designed for both nonmajors and students who anticipate becoming majors in literature who would like a broad-based introduction to the field.

LTWL 87. Freshman Seminar (1)
The Freshman Seminar Program is designed to provide new students with the opportunity to explore an intellectual topic with a faculty member in a small seminar setting. Freshman seminars are offered in all campus departments and undergraduate colleges, and topics vary from quarter to quarter. Enrollment is limited to fifteen to twenty students, with preference given to entering freshmen. *No prerequisites.*

LTWL 90. Undergraduate Seminar (1)
Readings and discussions focused on a writer, period, or literary topic. The aim of the course is to acquaint the student with literature as a field of university-level study. Repeatable for credit.

LTWL 99. Lower-Division Independent Study (4)
Independent study at the lower-division level, in an area not covered by the department's regular course offerings, under the direction of a member of the Literature Department faculty. *Prerequisites: lower-division standing; cumulative 3.0 GPA.*

UPPER-DIVISION

Prerequisite: upper-division standing or consent of instructor. Additional prerequisites may be specified below.

LTWL 100. Mythology (4)
A study of various bodies of myth: their content, form, and meaning. May be repeated for credit as topics vary.

LTWL 101. What Socrates Knew (4)
Socratic perspectives on the nature of life and death, virtue and happiness, love and the gods.

LTWL 102. Women in Antiquity (4)
Selected topics in classical culture, including women and myth, women in Greek and Roman society, and the representation of women in classical literature. May be repeated for credit when topics vary.

LTWL 106. The Classical Tradition (4)
Greek and Roman literature in translation. May be repeated for credit as topics vary.

LTWL 107. Prose Fiction (4)
Aspects of prose fiction. Not confined to a single national literature. Texts may be read in English. May be repeated for credit as topics vary.

LTWL 108. Words and Their Vicissitudes (4)
The history of English and its forebears, focusing on the quirky nature of semantic change in order to equip students with a basis for evaluating metaphor, metonymy, and other forms of verbal deviance. *Prerequisite: upper-division standing.*

LTWL 110B. Folk and Fairy Tales (4)
A study of folk and fairy tales from various cultures, from the point of view of literary form, psychological meaning, and cultural function. May be repeated for credit as topics vary.

LTWL 111. Medieval Studies (4)
A lecture/discussion course designed to explore a variety of topics in medieval literatures and cultures. Topics may include a genre or combination of genres (e.g., drama, romance, lyric, allegory), or a central theme (e.g., the Crusades or courtly love).

LTWL 114. Children's Literature (4)
A study of literature written for children in various cultures and periods. May be repeated for credit as topics vary.

LTWL 115. Contemporary Literature (4)
A study of novels and authors of the present and recent times. May be repeated for credit as topics vary.

LTWL 116. Adolescent Literature (4)
A study of fiction written for the young adult in various cultures and periods. Consideration will be given to the young adult hero in fiction. May be repeated for credit as topics vary.

LTWL 120. Popular Literature and Culture (4)
A study of various popular forms—such as pop music, cult books, film, fashion, magazines, graphic arts—within a broader cultural context. Focus may be on a particular genre (e.g., best sellers) or era (e.g., the sixties). May be repeated for credit when topics vary.

LTWL 122. Fantasy (4)
Reading and analysis of various works that fall into several categories of the fantastic—e.g., heroic, gothic, irrealist, postmodern—with particular attention to the cultural uses of myth, folklore, and fantasy, and to the psychological and structuralist theories of same. May be repeated for credit when topics vary.

LTWL 124. Science Fiction (4)
An exploration of the genre—past and present, in literature and the visual media—as a cultural response to scientific and technological change, as modern mythmaking, and as an enterprise serving a substantial fan subculture. May be repeated for credit when topics vary.

LTWL 128. Introduction to Semiotics and Applications (4)
Semiotics, basically a theory of signification, describes the models and conceptual constructs through which meaning is grasped and produced. Background in the history of semiotics and its dominant models. *Prerequisite: upper-division standing.*

LTWL 129. Wisdom: The Literature of Authority (4)
What is wisdom? Does wisdom refer to a specific type of discourse; a literary genre; a specific content that holds true transculturally and transtemporally? This class will consider these questions by reading literature from diverse times and places. *Prerequisite: upper-division standing.*

LTWL 131A. Topics in Early Christian Literature: The New Testament (4)
An introduction to the writings of the New Testament, their creation, collection, and critical study.

LTWL 131B. Topics in Early Christian Literature: Paul and the Invention of Christianity (4)
An evaluation of ancient and modern accounts of Christian origins set against a careful reading of early Jewish and Christian texts (canonical and non-canonical).

LTWL 131C. Topics in Early Christian Literature: Reinventing Jesus (4)
A survey of the "gospels" of the first three centuries for light they may (or may not) shed on the historical figure of Jesus, set within the context of religious biography in late antiquity.

LTWL 131D. Topics in Early Christian Literature: The Fourth Gospel (4)
A solution to the riddle of the Fourth Gospel.

LTWL 131E. Topics in Early Christian Literature: The History of Heresy (4)
Study of "heretical" movements within the first three centuries of Christianity's history (e.g., gnosticism).

LTWL 131F. Topics in Early Christian Literature: Christianity and the Roman Empire (4)
An evaluation of significant attempts (from Edward Gibbon to Peter Brown) to explain the "rise" of Christianity and the "decline and fall" of the Roman Empire.

LTWL 131G. Topics in Early Christian Literature: Against the Christians (4)
From Celsus to Julian the Apostate, the pagan assault on Christianity in the intellectual, political, and religious context of late antiquity.

LTWL 133. Religion: Inside Out and Upside Down (4)
A study of the nature and importance of place in Western religious imagination, through a comparative reading of the ancient Mesopotamian "Epic of Gilgamesh", the early Christian "Gospel of John", and Ridley Scott's futuristic film noir, "Blade Runner".

LTWL 135. A The Buddhist Imaginary (4)
An introduction to the imaginative universe of Indian Buddhism, with a focus on the connection between cosmological models and liberative practices. In this class we read Buddhist narrative and doctrinal literatures, supplemented by archaeological and art historical artifacts. *Prerequisite: upper-division standing or consent of instructor.*

LTWL 136. Goddesses and Women in India (4)
This course uses Hindu texts, along with art and film, to explore the intersection of literary representation and real life. How does Hindu literature, which fully supports the belief in powerful goddesses, both empower women and constrain them? *Prerequisite: upper-division standing or consent of instructor.*

LTWL 137. Sanskrit (4)
Study of classical Sanskrit, including grammar and reading.

LTWL 138. Critical Religion Studies (4)
Selected topics, texts, and problems in the study of religion. May be repeated for credit when content varies.

LTWL 139. Gnosticism: The Religious Underground from Late Antiquity to the New Age (4)
A survey of Gnostic currents in religious thought which influenced the Abrahamic traditions of Judaism, Christianity, and Islam, and which resurfaced periodically as heretical challenges to these mainstream traditions and their doctrinal orthodoxies.

LTWL 140. Novel and History in the Third World (4)
This course sets out to explore the relation between the novel and the "dependent" history of the Third World, contrasting and comparing the uses of history in the European novel as defined in the theoretical analysis of Lukacs with uses of history in the Third World novel. An analysis of major themes and movements common to selected ethnic literature in the United States and national literatures in the Third World.

LTWL 141. Islam and Modernity (4)
A survey of developments in the Islamic world during the period of European colonial domination and its aftermath, with special attention to the works of leading Muslim thinkers (e.g., Sayid Ahmed Khan, Muhammad Abduh, Hasan al Banna, Ruhallah Khomeini, among others.)

LTWL 145. South Asian Religious Literatures: Selected Topics (4)
One or two topics in the religious literature of South Asia will be examined in depth. Repeatable for credit when topics vary. *Prerequisite: upper-division standing or consent of instructor.*

LTWL 149. The Last Turn of the Century in the West (4)
A multi-media examination of the momentous cultural and intellectual changes that accompanied the last turn of the century (nineteenth–twentieth) in the West. Areas covered include literature, philosophy, visual arts, music, religion, social movements, and scientific thought.

LTWL 150. Modernity and Literature (4)
Explores the various cross-cultural historical, philosophical, and aesthetic ideas which formed the basis of most twentieth-century literature. Literature from the Americas, Europe, Asia, and Africa will be studied through lectures and the reading of texts in English translation. Repeatable for credit when topics vary.

LTWL 155. Gender Studies (4)
The study of the construction of sexual differences in literature and culture. May be repeated for credit when topics vary.

LTWL 160. Women and Literature (4)
This course will explore the relationship between women and literature, i.e., women as producers of literature, as objects of literary discourse, and as readers. Foreign language texts will be read in translation. May be repeated for credit as topics vary.

LTWL 170. Specialized Genres in Literature (4)
The study of literary genres that do not fall into the ordinary categories of lyric, drama, fiction, and prose. Topics vary from year to year. May be repeated for credit as topics vary.

LTWL 172. Special Topics in Literature (4)
Studies in specialized literary, philosophic, and artistic movements, approaches to literature, literary ideas, historical moments, etc.

LTWL 176. Literature and Ideas (4)
The course will center on writers or movements of international literary, cultural, or ideological significance. The texts studied, if foreign, may be read either in the original language or in English. May be repeated for credit as topics vary.

LTWL 180. Film Studies and Literature: Film History (4)
The study of film history and its effects upon methods of styles in literary history. Repeatable for credit when topics vary.

LTWL 181. Film Studies and Literature: Film Movement (4)
Study of analogies between literary movements and film movements. Repeatable for credit when topics vary.

LTWL 183. Film Studies and Literature: Director's Work (4)
Methods of criticism of author's work applied to the study and analysis of film director's style and work. Repeatable for credit when topics vary.

LTWL 184. Film Studies and Literature: Close Analysis of Filmic Text (4)
Methods of literary analysis applied to the study of shots, sequences, poetics, and deep structure in filmic discourse. Repeatable for credit when topics vary.

LTWL 185. Film Studies and Literature: Interdisciplinary Issues (4)
Inquiry into interrelated and interdisciplinary issues concerning the diverse field of film studies and literature.

TWS 21-22-23-24-25-26. Third World Literatures (4-4-4-4-4-4)
(See entry under "Third World Studies" heading.)
The courses in this sequence are equivalent to world literature courses. The sequence satisfies Marshall College general-education requirements.

Seminars/Independent Studies

LTWL 191. Honors Seminar (4)
Explorations in critical theory and method. This course, designed to prepare students to write an honors thesis, is open only to literature majors invited into the department's Honors Program.

LTWL 195. Apprentice Teaching (0 or 4)
Undergraduate instructional assistance. Student must (1) prepare reading materials assigned by the professor; (2) lead student discussions; (3) assist professor in grading; and (4) prepare report to professor at conclusion of quarter concerning his/her work.

LTWL 196. Honors Thesis (4)
Senior thesis research and writing for students who have been accepted for the Literature Honors Program and who have completed LTGN 191. Oral exam. *Prerequisite: permission of department.*

LTWL 198. Directed Group Study (4)
Research seminars and research, under the direction of faculty member. *Prerequisite: permission of department.*

LTWL 199. Special Studies (2 or 4)
Tutorial; individual guided reading in areas of literature (in translation) not normally covered in courses. May be repeated for credit three times. (P/NP grades only.) *Prerequisites: upper-division standing and permission of department.*

GRADUATE

LTWL 500. Apprentice Teaching in Literature (2 or 4)
Consideration of pedagogical methods appropriate to undergraduate teaching in literature courses under the supervision of instructor of course. Doctoral students in literature are required to participate in undergraduate teaching for a minimum of twelve units (two to four units per quarter) prior to completion of the Ph.D. degree.

LTWL 501. Apprentice Teaching in Humanities (2 or 4)
Consideration of pedagogical methods appropriate to undergraduate teaching in humanities sequences under the supervision of instructor of course. Doctoral students in literature are required to participate in undergraduate teaching for a minimum of twelve units (two to four units per quarter) prior to completion of the Ph.D. degree.

LTWL 502. Apprentice Teaching in Muir College (2 or 4)
Consideration of pedagogical methods appropriate to undergraduate teaching in Muir College courses under the supervision of instructor of course. Doctoral students in literature are required to participate in undergraduate teaching for a minimum of twelve units (two to four units per quarter) prior to completion of the Ph.D. degree.

LTWL 503. Apprentice Teaching in Marshall College (2 or 4)
Consideration of pedagogical methods appropriate to undergraduate teaching in Marshall College courses under the supervision of instructor of course. Doctoral students in literature are required to participate in undergraduate teaching for a minimum of twelve units (two to four units per quarter) prior to completion of the Ph.D. degree.

LTWL 504. Apprentice Teaching in Warren College (2 or 4)
Consideration of pedagogical methods appropriate to undergraduate teaching in Warren College courses under the supervision of instructor of course. Doctoral students in literature are required to participate in undergraduate teaching for a minimum of twelve units (two to four units per quarter) prior to completion of the Ph.D. degree.

LTWL 506. Apprentice Teaching in Roosevelt College (2 or 4)
Consideration of pedagogical methods appropriate to undergraduate teaching in Eleanor Roosevelt College courses under the supervision of instructor of course. Doctoral students in literature are required to participate in undergraduate teaching for a minimum of twelve units (two to four units per quarter) prior to completion of the Ph.D. degree.

WRITING/LITERATURE

LOWER-DIVISION

LTWR 8A. Writing Fiction (4)
Study of fiction in both theory and practice. Narrative technique studied in terms of subjectivity and atmosphere, description, dialogue, and the editing process will be introduced through readings from the history of the novel and short story. Writing exercises accompany reading assignments. *Prerequisite: completion of college writing requirement.*

LTWR 8B. Writing Poetry (4)
Study and practice of poetry as artistic and communal expression. Techniques of composition (traditional forms, *avant garde* techniques, dramatic monologue, performance poetry, and new genre) studied through written and spoken examples of poetry. Writing exercises accompany reading assignments. *Prerequisite: completion of college writing requirement.*

LTWR 8C. Writing Nonfiction (4)
Study of nonfictional prose in terms of genre and craft. Techniques of composition (journalism, essay, letters, reviews) will be studied through written examples of the genre. Practical imitations and exercises accompany the reading assignments. Prerequisite to upper-division non-fiction prose workshops. *Prerequisite: completion of college writing requirement.*

UPPER-DIVISION

Departmental approval is required for enrollment in all upper-division Lit/Writing courses.

Prerequisite: upper-division standing or consent of instructor. Additional prerequisites may be specified below.

(See Department of Theatre for course offerings in dramatic writing.)

Prose Fiction, Poetry, Media Workshops

LTWR 100. Short Fiction (4)
A workshop for students with some experience and special interest in writing fiction. This workshop is designed to encourage regular writing in the short forms of prose fiction and to permit students to experiment with various forms. There will be discussion of student work, together with analysis and discussion of representative examples of short fiction from the present and previous ages. May be taken for credit three times. *Prerequisite: LTWR 8A.*

LTWR 101. Beginning Poetry Workshop (4)
A workshop for beginning students of poetry. This course has weekly writing assignments in basic poetic forms; readings from ancient through contemporary poetry. Prepares students for LTWR 102 and other more advanced poetry workshops. May be taken only once. *Prerequisite: LTWR 8B.*

LTWR 102. Poetry (4)
A workshop for students with some experience and special interest in writing poetry. This workshop is designed to encourage regular writing of poetry. There will be discussion of student work, together with analysis and discussion of representative examples of poetry from the present and previous ages. May be taken for credit three times. *Prerequisite: LTWR 8B.*

LTWR 104. The Novella (4)
Workshop for fiction writers ready to tackle longer forms. Each student will produce a novella of at least fifty-pages by the end of the quarter. We'll look at examples of this form as well as films and comic novels to explore editing techniques that facilitate the writer's growing force and complexity of vision. *Prerequisites: LTWR 100; department approval.*

LTWR 106. Science Fiction, Fantasy, Irrealism (4)
In this workshop, students will practice skills of narration, characterization, and style with particular attention to the demands of non-realistic genres, especially the challenge of suspending disbelief in fictional environments that defy conventional logic. Readings and lectures will accompany writing exercises. *Prerequisites: LTWR 8A; department approval.*

LTWR 107. Writing for Children (4)
A workshop in writing for young children (5–8 years). The stories will be directed towards the act of reading aloud, either at bedtime or in a group situation. There will be many weekly readings assigned in, and about, the genre. *Prerequisites: LTWR 8A; department approval.*

LTWR 108. Writing for Young Adults (4)
A workshop in writing for 9–12 year-olds. Students will be asked to write one long chapter story or a series of short stories for young adults to read to themselves. The stories will generally involve young teens. Weekly readings will be assigned. *Prerequisites: LTWR 8A; department approval.*

LTWR 109. Writing and Publishing Children's Literature (4)
A workshop in writing for children, with the additional focus of exploring successful approaches to publication of children's stories. There will be regular weekly reading and writing assignments.. *Prerequisites: LTWR 8A; LTWR 107 recommended; department approval via stamp or pre-authorization.*

LTWR 110. Screen Writing (4)
A workshop designed to encourage writing of original screen plays and adaptations. There will be discussion of student work, together with analysis of discussion of representative examples of screen writing. May be taken for credit three times.

LTWR 112. Adapting Literature to the Screen (4)
Development of a feature-length screenplay based on poems or works of fiction or non-fiction. This course will provide a basic knowledge of the adaptation process from synopsis, through step outline, to fully developed treatment. *Prerequisites: LTWR 8A or 8B or 8C, department approval.*

LTWR 113. Intercultural Writing (4)
This course is an introduction to modes of writing from other cultural systems vastly different from the cultural-aesthetic assumptions of Anglo-American writing. While disclosing the limitations of the English language, this course attempts to provide new language strategies for students.

LTWR 115. Experimental Writing (4)
This workshop explores writing for which the traditional generic distinctions of prose/poetry, fiction/documentary, narrative/discourse do not apply. Students taking this course will be asked to challenge the boundaries of literature to discover new forms and modes of expression. May be taken for credit three times.

LTWR 117. Landscape Poetry (4)
The differences between landscape poetry written in East Asia and Western counterparts form an exciting subject as well as a challenge to habits of language. We will read from the history of landscape poetry, and produce and critique new poems. *Prerequisites: LTWR 8B; department approval.*

LTWR 119. Writing for Performance (4)
A workshop and survey of experimental approaches to the writing and production of performance works in a range of literary genres. Emphasis will be placed on the integration of written texts with non-verbal elements from the visual arts, theater, and music. *Prerequisite: LTWR 8A or 8B, to be determined by quarterly offerings of LTWR 119.*

Nonfiction Prose Workshops

LTWR 120. Personal Narrative (4)
A workshop designed to encourage regular writing of all forms of personal experience narrative, including journals, autobiography, firsthand biography, and firsthand chronicle. Instructor and students will discuss student work as well as published personal narratives. *Prerequisite: LTWR 8C.*

LTWR 121. Media Writing (4)
Workshop focusing on the review, the op-ed piece, the column, the blurb, the profile, the interview, and "content-providing" for Web sites. We'll examine current examples of media writing; students will produce a body of work and critique one another's productions. *Prerequisites: LTWR 8C; department approval.*

LTWR 122. Writing for the Sciences (4)
A workshop in writing about science for the public. Students will study and then construct metaphors or analogues which introduce readers to scientific perplexities. May be repeated for credit when topics vary

LTWR 123. Biographical Writing (4)
Workshop in biographical writing. The class will read published examples, consider what constitutes a suitable subject for biography, and discuss research techniques and sources. Each student will work on a profile-length or book chapter-length biography, submitting installments throughout the quarter. *Prerequisites: LTWR 8C; department approval.*

LTWR 125. Persuasion (4)
A workshop in the writing of argument or persuasion, with particular attention to strategies of persuasion for different kinds of audiences. Instructor and students will discuss student work as well as published work. May be taken for credit three times. *Prerequisite: LTWR 8C.*

LTWR 127. General Nonfiction Prose Workshop (4)
A workshop designed to encourage the writing of all forms of nonfiction prose. This workshop is usually limited to advanced students in the writing major. May be taken for credit three times. *Prerequisite: LTWR 8C.*

LTWR 128. Editing Workshop (4)
A workshop to acquaint students with the fundamentals of bringing written works from concept to publication. Genres covered will vary with instructor.

LTWR 129. Distributing Literature (4)
Workshop designed to critique and engage the means of distributing literature within culture. Publishing from "zine" through mainstream publication; Web publishings; readings and "slams"; publicity and funding; colloquia with writers; politics and literature; and the uses of performance and media. *Prerequisites: LTWR 100 or LTWR 102 or LTWR 120 or LTWR 127; department approval through course pre-authorization department stamp.*

Writing Process, Written Discourse, and Writing Pedagogy

These courses are not writing workshop courses like those listed above. Rather, they examine various aspects of writing as a field of study and writing pedagogy. Writing majors who plan to teach writing may be particularly interested in these courses. See the department for applicability of these courses to the writing major requirements.

Note: As of fall 1991, all writing majors are required to take one course chosen from offerings numbered LTWR 140–144 to fulfill one of their upper-division requirements.

LTWR 141. The Process of Writing (4)
A study of writing as a creative process. Review of research on creativity and on the writing process and analysis of writers' introspective accounts of their work. Delineation of the stages in writing process and exploration of implications for learning to write.

LTWR 142. Forms of Written Discourse (4)
A review of current rhetorical theory and discourse theory. Some attention to recent developments in text linguistics. Students will write several discourse types and explore differences among the types, with special attention to differences for the writing process and for the structure of the written discourse itself.

LTWR 143. Stylistics and Grammar (4)
A close look at sentence-level features of written discourse–stylistics and sentence grammars. Students will review recent research on these topics and experiment in their own writing with various stylistic and syntactic options.

LTWR 144. The Teaching of Writing (4)
Wide reading in current theory and practice of teaching writing in schools and colleges. Careful attention to various models of classroom writing instruction and to different approaches in the individual conference. Students in this course may observe instruction in the UCSD college writing programs or tutor freshman students in those programs.

LTWR 148. Theory for Writers/Writing for Theory (4)
Hybrid workshop offering writing students a working knowledge of literary theory while exposing literature students to practical techniques from poetry, fiction, and nonfiction to refresh their writing of theoretical nonfiction texts. Discussion of student work and published work. *Prerequisite: department approval.*

Directed Study and Special Study

LTWR 195. Apprentice Teaching (4)
Undergraduate instruction assistance. Students will 1) assist TA in editing students' writing for LTWR 8A and 8C during class and outside of class; and 2) prepare a paper and report for the professor at the end of the quarter. *Prerequisite: LTWR 144, The Teaching of Writing.*

LTWR 196. Honors Thesis (4)
Senior thesis research and writing for students who have been accepted for the Literature Honors Program and who have completed LTGN 191. Oral exam.

LTWR 198. Directed Group Study (2 or 4)
Directed group study in areas of writing not normally covered in courses. (P/NP grades only.) Repeatable for credit when areas of study vary.

LTWR 199. Special Studies (2 or 4)
Tutorial; individual guidance in areas of writing not normally covered in courses. (P/NP grades only.) *Prerequisites: upper-division standing and permission of department.* May be taken for credit three times.

GRADUATE

LTWR 260. Autoethnographies of Literacy (4)
Designed for public school teachers, this writing seminar concerns ethnographic and autoethnographic studies of "literates" and "illiterates" in the United States. *Prerequisite: graduate standing or consent of instructor.*

LTWR 271. Theory and Practice of College Writing Instruction (4)
In this course we will explore the implications for writing instruction of current discourse theory and of linguistics (sentence-level and text-level). We will also review research on writing instruction and look carefully at several models of classroom instruction and individual conferencing.

LTWR 272. Research in Composing and Writing Discourse (4)
This course will survey current research on composing and written discourse. It will also explore various problems and issues in designing research studies.

LTWR 282. Writing States (4)
This course will be a cross-genre writing workshop where graduate students in literature with some experience in creative writing can work with other writers and broaden their own practices. The seminar will read selected texts that spur specific writing assignments. Students who already have a new or ongoing writing project can workshop that as an alternative to doing assignments. The group will critique one another's efforts, each participant creating a twenty-page manuscript. Also at the end of the quarter the students will collectively agree on a project—a reading, performance, video, or publishing project that will document the workshop. *Prerequisite: graduate standing or consent of instructor.*

The Making of the Modern World

OFFICE: Eleanor Roosevelt College
Administration Building
http://provost.ucsd.edu/roosevelt/mmw/

The Making of the Modern World is a six-course sequence required of all Eleanor Roosevelt College students. It is designed to encourage them to think historically, comparatively, and in an interdisciplinary manner about world cultures. Disciplinary perspectives include literature, history, philosophy, anthropology, sociology, political science, and fine arts. Students will examine and interpret primary documents and artifacts from diverse eras and cultures, as well as learn about them from secondary sources. All six quarters of the sequence will include lectures, discussions, and writing assignments. Courses in the sequence may be taken for a letter grade only.

Students in the Making of the Modern World 2 and 3 (offered in winter and spring quarters respectively) fulfill their University of California composition requirement by receiving intensive instruction in university-level writing. Subject matter for writing instruction is drawn from or related to course material. Instruction in writing is provided in discussion sessions, which meet twice each week. Each of these two writing-intensive quarters carries six units of credit. Students must have satisfied the university's Subject A requirement in English composition before enrolling in the Making of the Modern World 2 or 3.

For further details on Eleanor Roosevelt College requirements, see "Eleanor Roosevelt College, General-Education Requirements."

COURSES

TRADITIONS

1. Prehistory and the Birth of Civilization (4)
This quarter introduces students to what is known about early humans, including the evolution of the human body and the reconstruction of Paleolithic and Neolithic cultures. It examines contemporary hunting-and-gathering and tribal societies and illuminates the complexity of such cultures with respect to mythology and oral tradition, interpersonal relations, and ecological practices. The course will conclude with an analysis of the emergence of large agrarian societies and the earliest great settled communities and civilizations. Three hours of lecture, one hour of discussion. Open to Eleanor Roosevelt College students only. (Letter grade only.) (F)

2. The Great Classical Traditions (6)
An introduction to five major classical civilizations of the ancient world. Equal attention will be given to the ancient Near East, Greece, India, China and the Roman Republic, all of which have left legacies to the present. The course covers the great early systems of religious and social thought, using an approach that combines history and social science. This course includes intensive instruction in writing expository prose. Three hours of lecture, two hours of writing and discussion sections. *Prerequisite: satisfaction of the Subject A requirement.* Open to Eleanor Roosevelt College students only. (Letter grade only.) (W)

3. The Medieval Heritage (6)
A survey of the period from about 29 B.C.E. to 1200 C.E., this quarter concentrates on the development of China from the Han to the Sung Dynasties, the growth and eventual dissolution of the Roman Empire, the development of Christianity, and the rise of Islam. This course includes intensive instruction in university-level writing. Three hours of lecture, two hours of writing and discussion sections. *Prerequisite: satisfaction of the Subject A requirement.* Open to Eleanor Roosevelt College students only. (Letter grade only.) (S)

TRANSFORMATIONS

4. New Ideas and the Clash of Cultures (4)
An examination of the world from 1200 to 1750, the course focuses on the transition from medieval to modern by addressing philosophical, social, political, economic, and technological changes in Asia, Europe, and Islamic territories. Topics may include the Mongol invasions and their impact; the European Renaissance, Reformation, and Scientific Revolution; Islamic and Chinese empires; exploration and trade; and European expansion into the Americas. Three hours of lecture, one hour of discussion. *Prerequisites: satisfaction of the Subject A requirement; successful completion of MMW 2 and/or MMW 3.* Open to Eleanor Roosevelt College students only. (Letter grade only.) (F)

5. Revolution, Industry, and Empire (4)
A consideration of the great changes in European society from the late eighteenth century to the Russian Revolution, and their impact on the non-Western world. Topics include industrialization, the rise of nationalism and the nation-state, Western imperialism, and the colonial experience. Developments in non-Western countries during this period will be examined from their own internal perspective. Three hours of lecture, one hour of discussion. *Prerequisites: satisfaction of the Subject A requirement; successful completion of MMW 2, MMW 3, and/or MMW 4.* Open to Eleanor Roosevelt College students only. (Letter grade only.) (W)

6. Twentieth Century and Beyond (4)
The course begins with a consideration of the causes and consequences of World War I, and then looks at the post-war crisis of liberal values and institutions. It addresses the deepening of crisis in the thirties, especially evident in the emergence of ideological politics and extreme nationalism in the context of world-wide depression. This period of crisis provides the background for understanding World War II. Attention is then devoted to the Cold War, the competition between capitalism and communism, and the process of decolonization. The course ends with a discussion of the collapse of communism and the emerging world order (or disorder). Three hours of lecture, one hour of discussion. *Prerequisites: satisfaction of the Subject A requirement; successful completion of MMW 2, MMW 3, MMW 4, and/or MMW 5.* Open to Eleanor Roosevelt College students only. (Letter grade only.) (S)

Materials Science and Engineering Program

Student Affairs: Engineering Building 2, Room 169, Warren College
World Wide Web: http://matsci.ucsd.edu

Professors

Sungho Jin, Ph.D., *MAE, Program Director*
Gustaf Arrhenius, Ph.D., *SIO*
Robert J. Asaro, Ph.D., *SE*
David J. Benson, Ph.D., *MAE*
Ami Berkowitz, Ph.D., *Emeritus, Physics*
John E. Crowell, Ph.D., *Chemistry and Biochemistry*
Robert Dynes, Ph.D., *Physics, UC President*
Sadik Esener, Ph.D., *ECE*
Yeshaiahu Fainman, Ph.D., *ECE*
Yuan-Cheng Fung, Ph.D., *Emeritus, Bioengineering*
David Gough, Ph.D., *Bioengineering*
Gilbert A. Hegemier, Ph.D., *SE*
Frances Hellman, Ph.D., *Physics*
Vistasp Karbhari, Ph.D., *SE*
John B. Kosmatka, Ph.D., *SE*
Sergi Krasheninnikov, Ph.D., *MAE*
Clifford Kubiak, Ph.D., *Chemistry and Biochemistry*
S.S. Lau, Ph.D., *ECE*
Yu-Hwa Lo, Ph.D., *ECE*
Huey-Lin Luo, Ph.D., *ECE*
M. Brian Maple, Ph.D., *Physics*
Xanthippi Markenscoff, Ph.D., *MAE*
Joanna McKittrick, Ph.D., *MAE*
Marc A. Meyers, Ph.D., *MAE, Associate Director, Institute for Mechanics and Materials*
David R. Miller, Ph.D., *MAE, Associate Vice Chancellor, Academic Affairs*
Hidenori Murakami, Ph.D., *MAE*
Siavouche Nemat-Nasser, Ph.D., *MAE, Director, Center of Excellence for Advanced Materials*
Vitali F. Nesterenko, Ph.D., *MAE*
Johann K. Oesterreicher, Ph.D., *Chemistry and Biochemistry*
M. Lea Rudee, Ph.D., *Emeritus, ECE*
Michael J. Sailor, Ph.D., *Chemistry and Biochemistry*
Geert W. Schmid-Schoenbein, Ph.D., *Bioengineering*
Ivan K. Schuller, Ph.D., *Physics*
Lu Jeu Sham, Ph.D., *Physics*
Jan Talbot, Ph.D., *MAE*
Frank E. Talke, Ph.D., *MAE, CMRR Endowed Chair*
Charles W. Tu, Ph.D., *ECE*
Kenneth S. Vecchio, Ph.D., *MAE*
Harry H. Wieder, D.Sc., *In-Residence, ECE*
Edward T. Yu, Ph.D., *ECE*
Paul Yu, Ph.D., *ECE*

Associate Professors

Sangeeta Bhatia, Ph.D., *Bioengineering*
Richard K. Herz, Ph.D., *MAE*
Yitzhak Tor, Ph.D., *Chemistry and Biochemistry*
George Tynan, Ph.D., *MAE*

Assistant Professor

Prabhakar Bandaru, Ph.D., *MAE*

Materials Science and Engineering Program is concerned with the study of the structure and properties of materials. The Materials Science and Engineering Program at UCSD aims to provide fundamental knowledge for quantitative understanding of materials with the objective of predicting, modifying, and tailoring the properties of materials to yield, at the technology level, enhanced material performance. The foundations of materials science are the basic sciences of physics, chemistry, and mathematics. The great variety of materials response, at the optical, magnetic, electrical, mechanical, and chemical levels, requires a solid scientific foundation and breadth of basic knowledge from the materials scientists. The interdisciplinary nature of the program at UCSD is ideally suited to address this requirement. The graduate of the Materials Science and Engineering Program benefits from unique research facilities existing at UCSD. These include the resources in the Departments of MAE, SE, ECE, Physics, Chemistry/Biochemistry, Bioengineering, and SIO, as well as in the Center of Excellence for Advanced Materials and the Center for Magnetic Recording Research. Of particular emphasis within the program is the experimental investigation and theoretical modeling of the mechanical response and failure models of advanced materials at ultrahigh strain rates; electronic, superconducting, magnetic, and optical properties of materials for advanced applications; biomaterials; and advanced composite materials for civil structures.

The Graduate Program

The Materials Science and Engineering Program is interdisciplinary, with participation of faculty members from several departments. Faculty from the following departments participate in the Materials Science and Engineering Graduate Program: the Departments of Mechanical and Aerospace Engineering (MAE), Structural Engineering (SE), Bioengineering, Physics, Scripps Institution of Oceanography (SIO), Electrical and Computer Engineering (ECE), and Chemistry. The governance of the program is carried out by the executive committee of the program. The executive committee coordinates all affairs of the Materials Science and Engineering Program, including student admissions, degree requirements, graduate courses in materials science given by various participating departments, maintenance of laboratory instructional facilities, seminars, special courses, part-time instructors, and related matters.

Undergraduate preparation for the materials science and engineering M.S. and Ph.D. normally would include a degree in materials science and in engineering or physical sciences, such as physics, chemistry, geology, and related disciplines. Students are expected to have an adequate mathematics, physics, chemistry, and related basic sciences background.

Master's Degree Program

The program offers the M.S. degree in materials science and engineering under both the Thesis Plan I and the Comprehensive Examination Plan II; see "Graduate Studies: Master's Degree." The requirements for the M.S. degree are as follows:

1. All students must complete a total of thirty-six units.
2. All students must complete at least six of the following nine core courses:

   (1) MS 200; (2) MS 227; (3) MS 201A; (4) MS 201B; (5) MS 201C; (6) MS 205A; (7) Physics 152A; (8) MS 251; (9) MS 252.

   (Physics 211A can replace 152A with adviser's permission.) See "Courses" for descriptions.
3. Students may include up to twelve units of undergraduate courses. These include the one undergraduate core course, Physics 152A.
4. Enroll in MATS200, as required. See "Courses" for descriptions.
5. Remaining courses to complete the thirty-six unit requirement for the M.S. degree may be selected from an approved list of graduate courses with the consent of a faculty adviser.

6. Students either complete a thesis (Plan I) or pass a comprehensive examination (Plan II) as described in the "Graduate Studies" section of this catalog.
7. Students must meet all other requirements established by the university.

Students who transfer with some graduate credit or an M.S. from another institution will have their records reviewed by a faculty adviser, and an appropriate individual course of study may be approved.

The Ph.D. Program

After completing the M.S. degree (or meeting *equivalent requirements) and meeting the minimum* standard on the comprehensive examination to be admitted to or continue in the Ph.D. program, a student must:

1. Meet all the university's residency and other requirements.
2. Successfully complete three advanced graduate courses (in addition to those required for the M.S. degree) which have been approved by the student's potential dissertation adviser.
3. Enroll in MATS200, as required. See "Courses" for descriptions.
4. Pass the Literature Review Examination. This requirement must be successfully completed within one year after passing the Comprehensive Examination.
5. Pass the Ph.D. Qualifying Examination (Senate Exam) to be advanced to Ph.D. candidacy.
6. Successfully complete and defend a dissertation which, in the opinion of the dissertation committee, contains original work that should lead to publication of at least one significant article in an appropriate refereed journal.

In principle, it should be possible to finish the M.S. degree in three quarters, and a Ph.D. in an additional three years. Ph.D. time limits are as follows: Pre-candidacy—four years; Support limit—six years; Total time limit—seven years; Normative time limit for a properly prepared B.S. student—five years. (See "Graduate Studies–Ph.D. Time Limits" for further explanation.)

Departmental Examination

THE COMPREHENSIVE EXAMINATION

The examination will consist of twelve questions, two from each of the six core courses. A passing grade is 60 percent for the Master's degree, and 70 percent for the Ph.D. The examination will not exceed six hours in duration. The examination is usually administered the second week in January, and a week after spring quarter finals week in June. Typically, students take the exam after one year of full-time enrollment. This exam may only be retaken once before the end of the second year of study.

THE LITERATURE REVIEW EXAMINATION

The Literature Review Examination tests the student's ability to prepare and present a comprehensive overview of a topic based on existing journal literature. It should be a comprehensive discussion of the literature, scientific theory, problems or theoretical deficiencies, and possible areas of research in some area of materials science and engineering. The topic may be in the general area in which the student plans to pursue his or her thesis research, or it may be in an unrelated field. The topic must be approved by the three faculty member committee in advance of the seminar. The Literature Review Examination is not to be a discussion of the student's research project or their research proposal. A presentation which includes the student's own work which has not been published will constitute a no pass grade. This exam must occur within one year of the student having passed the Comprehensive Examination.

COURSES

GRADUATE

200. Graduate Seminar (0)
Each graduate student in the Materials Science and Engineering Program is expected to attend a weekly seminar in materials science or related areas. M.S. students must enroll for three quarters, Ph.D. students for six quarters, as of fall 1995. (S/U grades only.) (F,W,S)

201A. Thermodynamics of Solids (4)
The thermodynamics and statistical mechanics of solids. Basic concepts; equilibrium properties of alloy systems; thermodynamic information from phase diagrams, surfaces, and interfaces; crystalline defects. *Prerequisite: consent of instructor.*

201B. Solid State Diffusion and Reaction Kinetics (4)
Thermally activated processes, Boltzmann factor, homogeneous and heterogeneous reactions, solid state diffusion, Fick's laws, diffusion mechanisms, Kirkendall effect, Boltzman-Matano analysis, high diffusivity paths. *Prerequisite: consent of instructor.*

201C. Phase Transformations (4)
Classification of phase transformations: displacive and reconstructive transformations: classical and nonclassical theories of nucleation: Becker-Doering, Volmer-Weber, lattice instabilities, spinodal decomposition. Growth theories: interface migration, stress effects, terrace-ledge mechanisms, epitaxial growth, kinetics, and mechanics. Precipitation. Order-disorder transformations. Solidification. Amorphization. *Prerequisite: consent of instructor.* (Cross-listed with MAE 271C.)

205A. Imperfections in Solids (4)
Point, line, and planar defects in crystalline solids, including vacancies, self-interstitials, solute atoms, dislocations, stacking faults, and grain boundaries; effects of imperfections on mechanical properties; interactions of dislocations with point defects; strain hardening by micro-obstacles, precipitation, and alloying elements. *Prerequisite: consent of instructor.*

205B. Advanced Study of Defects in Solids (4)
Advanced topics in dislocation theory and dislocation dynamics. Defects and defects interactions. Atomistic and subatomistic effects. Physical models based on microscopic considerations. *Prerequisite: MS 205A or consent of instructor.* (Cross-listed with ECE 234B.)

207. Surface Reactions, Corrosion, and Oxidation (4)
The nature of surfaces; nucleation and growth of surface films. Techniques for studies of surface structures and of surface films. Types of corrosion phenomena and mechanisms of corrosion. Methods of corrosion control and prevention. Mechanisms of oxidation. Control of oxidation by alloying and surface coatings. *Prerequisite: MS 201A or consent of instructor.*

211A. Mechanical Properties (4)
Review of basic concepts in mechanics of deformation; elasticity, plasticity, viscoelasticity, and creep; effects of temperature and strain-rate on inelastic flow; microstructure and mechanical properties; application of basic concepts to selected advanced materials. *Prerequisite: consent of instructor.* (Cross-listed with MAE 229.)

213A. Dynamic Behavior of Materials I (4)
Elastic waves in continuum; longitudinal and shear waves. Surface waves. Plastic waves; shock waves; Rankine-Hugoniot relations. Method of characteristics, differential and difference form of conservation equations; dynamic plasticity and dynamic fracture. Shock wave reflection and interaction. *Prerequisite: consent of instructor.* (F) (Cross-listed with MAE 273A.)

218. Fatigue, Fracture, and Failure Analysis in Engineering Materials (4)
The course will cover the engineering and scientific aspects of fatigue crack initiation, stable crack growth, fatigue life predictions, selection of materials for fatigue applications, fractography, and failure analysis, including case studies. *Prerequisites: MAE 160 or equivalent and consent of instructor.*

225. Materials for Magnetic Recording (4)
Properties of magnetic materials utilized as magnetic recording media and heads: magnetic structure of oxides and metals; fine particle magnetism; micromagnetic analysis; hysteresis and reversal mechanisms of hard materials; dynamic processes and domain patterns of soft materials; thermal fluctuations; multilayer phenomena; giant magnetoresistance. *Prerequisites:*

undergraduate electromagnetism and solid state physics or consent of instructor. (Cross-listed with ECE 246A.)

227. Structure and Analysis of Solids (4)
Key concepts in the atomic structure and bonding of solids such as metals, ceramics, and semiconductors. Symmetry operations, point groups, lattice types, space groups, simple and complex inorganic compounds, structure/property comparisons, structure determination with X-ray diffraction. Ionic, covalent, metallic bonding compared with physical properties. Atomic and molecular orbitals, bands verses bonds, free electron theory. *Prerequisite: graduate student or consent of instructor.*

230. Electrochemistry (4)
Application of electrochemical techniques to chemistry research. Basic electrochemical theory and instrumentation: the diffusion equations, controlled potential, and current methods. Electro-chemical kinetics, Butler-Volmer, Marcus-Hush theories, preparative electrochemistry, analytical electrochemistry, solid and polymer electrolytes, semiconductor photo-electrochemistry. (Cross-listed with CHEM 240.)

233A-B. Processing and Synthesis of Advanced Materials (4-4)
Background information on conventional techniques: forging, rolling, drawing, casting. Rapid solidification processing of metals and ceramics. Production of composites. Directionally solidified eutectics. Combustion synthesis. Sol-gel synthesis of ceramics. Mechanical alloying. Shockwave synthesis and processing. Thin film techniques. Laser glazing. Electron beam mixing. Molecular beam epitaxy. Superplastic processing. *Prerequisite: consent of instructor.*

236. Ceramic and Glass Materials (4)
Powder synthesis, powder compaction and densification via different processing routes. Phase equilibria and crystallography in ceramic materials. Sintering, liquid and vapor phase processing and single crystal growth. Control of the microstructural development and interfacial properties to optimize properties for structural, thermal, electrical, or magnetic use. Topics in processing and use of advanced ceramic materials. Glass formation and structure, phase separation, viscous flow and relaxation. *Prerequisite: consent of instructor.*

240A. Scanning Electron Microscopy and X-Ray Microanalysis (4)
Electron optics, electron-beam-specimen interactions. Image formation in the SEM. The role of specimen and detector in contrast formation. Imaging strategies. X-ray spectral measurements. Qualitative and quantitative X-ray microanalysis. Materials specimen preparation. *Prerequisite: consent of instructor. The laboratory section will teach the operation of the microscope to conduct material analysis via SEM.*

240B. Transmission Electron Microscopy (4)
Operation and calibration of the TEM, lens defects and resolution, formation of images and diffraction patterns, electron diffraction theory (kinematic dynamical), indexing diffraction patterns, diffraction contrast. Quantitative analysis of crystal defects, phase contrast, and specimen preparation. *Prerequisite: MS 240A or consent of instructor. The laboratory section will teach the operation of the microscope to conduct material analysis via TEM.*

243. Modern Materials Analysis (4)
Analysis of the near surface of materials via ion, electron, and x-ray spectroscopes. Topics to be covered include particle solid interactions. Rutherford Backscattering, secondary ion mass spectroscopy, electron energy loss spectroscopy, particle induced x-ray emission, Auger electron spectroscopy, extended x-ray absorption fine structure and channeling. *Prerequisite: consent of instructor.* (Cross-listed with ECE 237.)

251. Structure and Properties of Electronic, Magnetic, and Photonic Materials (4)
Explores the interplay between the electronic, magnetic, and photonic properties of advanced engineering materials in relation to processing, fabrication, and microstructure. Semiconductors, metals, alloys, ceramics, polymers, and composite materials will be studied along with their practical applications. *Prerequisite: consent of instructor.* (Cross-listed with MAE 265.)

252. Biomaterials (4)
This class will cover biomaterials and biomimetic materials. Metal, ceramic, and polymer biomaterials will be discussed. Emphasis will be on the structure-property relationships, biocompatibility/degradation issues and tissue/material interactions. Synthesis and mechanical testing of biomimetic materials will also be discussed. *Prerequisite: consent of instructor.* (Cross-listed with MAE 266.)

253. Nanomaterials and Properties (4)
This course discusses synthesis techniques, processing, microstructural control, and unique physical properties of materials in nano-dimensions. Topics include nanowires, quantum dots, thin films, electrical transport, electron emission properties, optical behavior, mechanical behavior, and technical applications of nanomaterials. *Prerequisite: consent of instructor.* (Cross-listed with MAE 267.)

254. MEMS Materials, Fabrication, and Applications (4)
Fabrication of Micro-Electro Mechanical Systems (MEMS) by bulk and surface micromachining of single crystal, polycrystal, and amorphous silicon and other materials. Performance issues including electrostatic, magnetic, piezoelectric actuations, residual stresses, deformation. Novel device applications, future trends in smart materials and nano-electro-mechanical (NEMS) systems. *Prerequisite: consent of instructor.* (Cross-listed with MAE 268.)

255. Presentations, Inventions, and Patents (4)
This course covers methodology and skills for oral and written presentations. Topics include preparation of presentation materials, presentation exercise, publication manuscripts, research work proposals, understanding and securing of inventions and intellectual properties, patent applications and licensing. *Prerequisite: consent of instructor.* (Cross-listed with MAE 269.)

290. Topics in Materials Science (4)
A course to be given at the discretion of the faculty on topics of current interest in materials science.

295. Research Conference (2)
Group discussion of research activities and progress of group members. *Prerequisite: consent of instructor.*

296. Independent Study (4)
Prerequisite: consent of instructor.

299. Graduate Research (1-12)
(S/U grades only.)

Subject to the approval of a faculty adviser, students may also choose from the following courses offered by departments participating in the Materials Science and Engineering Program (see the relevant pages of this catalog for descriptions):

Mechanical and Aerospace Engineering (MAE)

MAE 229A. Mechanical Properties (4)
MAE 229B. Advanced Mechanical Behavior (4)
MAE 231A. Foundations of Solid Mechanics (4)
MAE 231B. Elasticity (4)
MAE 232A-B-C. Finite Element Methods in Solid Mechanics (4-4-4)
MAE 233A. Fracture Mechanics (4)
MAE 233B. Micromechanics (4)
MAE 233C. Advanced Mechanics of Composite Materials (4)
MAE 238. Stress Waves in Solids (4)
MAE 251. Structure and Analysis of Solids (4)
MAE 256. Rheology of Fluids (4)

Chemistry

Chem 240. Electrochemistry (4)

Electrical and Computer Engineering (ECE)

ECE 230A. Solid State Electronics (4)
ECE 230B. Solid State Electronics (4)
ECE 230C. Solid State Electronics (4)
ECE 234B. Advanced Study of Defect in Solids (4)
ECE 237. Modern Materials Analysis (4)
ECE 246A. Materials for Magnetic Recording (4)

Physics

Phys. 133/219. Condensed Matter/Materials Science Laboratory (2)
Phys. 152B/232. Electronic Materials (4)
Phys. 211A. Solid State Physics (5)
Phys. 211B. Solid State Physics (4)

Mathematics

OFFICE: 7018 Applied Physics and Mathematics Building, Muir College
http://math.ucsd.edu

Professors

Ian S. Abramson, Ph.D.
Jim Agler, Ph.D.
Randolph E. Bank, Ph.D.
M. Salah Baouendi, Ph.D.
Edward A. Bender, Ph.D.
James R. Bunch, Ph.D., *Chair*
Samuel R. Buss, Ph.D., *Vice Chair*
Bennett Chow, Ph.D.

Bruce K. Driver, Ph.D.
Peter F. Ebenfelt, Ph.D.
Thomas J. Enright, Ph.D.
John W. Evans, M.D., Ph.D., *Emeritus*
Ronald J. Evans, Ph.D.
Jay P. Fillmore, Ph.D., *Emeritus*
Carl H. FitzGerald, Ph.D.
Patrick J. Fitzsimmons, Ph.D.
Theodore T. Frankel, Ph.D., *Emeritus*
Michael Freedman, Ph.D., *Emeritus*
Adriano M. Garsia, Ph.D.
Ronald K. Getoor, Ph.D., *Emeritus*
Philip E. Gill, Ph.D.
Fan Chung Graham, Ph.D.
Mark W. Gross, Ph.D.
Leonard R. Haff, Ph.D.
Hubert Halkin, Ph.D., *Emeritus*
Guershon Harel, Ph.D.
J. William Helton, Ph.D.
Michael J. Holst, Ph.D.
James P. Lin, Ph.D.
Hans Lindblad, Ph.D.
Alfred B. Manaster, Ph.D., *Emeritus*
David A. Meyer, Ph.D.
John O'Quigley, Ph.D., *Emeritus*
Dimitris Politis, Ph.D.
Jeffrey M. Rabin, Ph.D., *Academic Senate Distinguished Teaching Award*
Jeffrey B. Remmel, Ph.D., *Associate Dean, Division of Physical Sciences*
Yosef Rinott, Ph.D., *Emeritus*
Burton Rodin, Ph.D., *Emeritus*
Helmut Rohrl, Ph.D., *Emeritus*
Murray Rosenblatt, Ph.D., *Emeritus*
Linda P. Rothschild, Ph.D., *Vice Chair*
Michael J. Sharpe, Ph.D.
Lance W. Small, Ph.D.
Donald R. Smith, Ph.D., *Emeritus*
Harold M. Stark, Ph.D.
Peter Teichner, Ph.D.
Audrey A. Terras, Ph.D.
Adrian R. Wadsworth, Ph.D.
Nolan R. Wallach, Ph.D.
Hans G. Wenzl, Ph.D.
Ruth J. Williams, Ph.D.
Daniel E. Wulbert, Ph.D., *Provost, Revelle College*
Efim Zelmanov, Ph.D.

Associate Professors

William M. McEneaney, Ph.D.
Kate Okikiolu, Ph.D.
Justin D. Roberts, Ph.D.
Van Vu, Ph.D.
John J. Wavrik, Ph.D.

Assistant Professors

Li-Tien Cheng, Ph.D.
Wee Teck Gan, Ph.D.
Lei Ni, Ph.D.
Cristian Popescu, Ph.D.
Jason Schweinsberg, Ph.D.
Glenn Tesler, Ph.D.

Senior Lecturer with Security of Employment

Frank B. Thiess, Ph.D., *Emeritus*

Lecturers with Security of Employment

John D. Eggers, Ph.D.
Norman A. Shenk, Ph.D., *Emeritus*

The Undergraduate Program

The mathematics department offers a wide range of courses in pure and applied mathematics for its majors and for students in other disciplines. The department offers six majors leading to the B.A. degree: mathematics, applied mathematics, mathematics–applied science, mathematics–computer science, joint major in mathematics and economics, and mathematics– secondary education, and one leading to the B.S. degree: mathematics–scientific computation. In addition, students can minor in mathematics. The department also has an Honors Program for exceptional students in any of the seven majors. See the sections on major programs and the other areas mentioned above as well as the course descriptions at the end of this section for more specific information about program requirements and the courses that are offered by the department. You may visit our Web site, math.ucsd.edu for more information including course Web pages, career advising, and research interests of our faculty.

First-Year Courses

Entering students must take the Mathematics Placement Exam prior to orientation unless they have either an appropriate score on a Calculus AP exam, a score of 650 or higher on the SAT II Math Level 2C exam, or transferable credit in calculus. The purpose of the Mathematics Placement Exam is to assess the student's readiness to enter the department's calculus courses. Some students will be required to take precalculus courses before beginning a calculus sequence.

Math. 3C is the department's preparatory course for the Math. 10 sequence, providing a review of algebraic skills, facility in graphing, and working with exponential and logarithmic functions.

Math. 4C is the department's preparatory course for the Math. 20 sequence, providing a brief review of college algebra followed by an introduction to trigonometry and a more advanced treatment of graphing and functions.

Math. 10A-B-C is one of two calculus sequences. The students in this sequence have completed a minimum of two years of high school mathematics. This sequence is intended for majors in liberal arts and the social and life sciences. It fulfills the mathematics requirements of Revelle College and the option of the general-education requirements of Muir College. Completion of two quarters fulfills the requirement of Marshall College and the option of Warren College and Eleanor Roosevelt College.

The other first-year calculus sequence, Math. 20A-B-C, is taken mainly by students who have completed four years of high school mathematics or have taken a college level precalculus course such as Math. 4C. This sequence fulfills all college level requirements met by Math. 10A-B-C and is required of many majors, including chemistry and biochemistry, bioengineering, cognitive science, economics, mathematics, molecular biology, psychology, MAE, CSE, ECE, and physics. Students with adequate backgrounds in mathematics are strongly encouraged to take Math. 20 since it provides the foundation for Math. 20D-E-F which is required for some science and engineering majors. **Note:** As of summer 2003, Math. 21C and 21D have been renumbered to Math. 20C and 20D.

Certain transfers between the Math. 10 and Math. 20 sequences are possible, but such transfers should be carefully discussed with an adviser. Able students who begin the Math. 10 sequence and who wish to transfer to the Math. 20 sequence, may follow one of three paths:

1. Follow Math. 10A with Math. 20A, with two units of credit given for Math. 20A. This option is not available if the student has credit for Math. 10B or Math. 10C. This option is available only if the student obtains a grade of A in Math. 10A or by consent of the Math. 20A instructor.
2. Follow Math. 10B with Math. 20B, receiving two units of credit for Math. 20B.
3. Follow Math. 10C with Math. 20B, receiving two units of credit for Math. 20B and two units of credit for Math. 20C.

Credit will not be given for courses taken simultaneously from the Math. 10 and the Math. 20 sequence.

Major Programs

The department offers six different majors leading to the Bachelor of Arts degree: (1) mathematics, (2) applied mathematics, (3) mathematics–applied science, (4) mathematics–computer science, (5) joint major in mathematics and economics, (6) mathematics–secondary education; and one leading to a B.S. degree: mathematics-scientific computation. The specific emphases and course requirements for these majors are described in the following sections. All majors must obtain a minimum 2.0 grade-point average in the upper-division courses used to satisfy the major requirements. Further, the student must receive a grade of C– or better in any course to be counted toward fulfillment of the major requirements. Any mathematics course numbered 100–194 may be used as an upper-division elective. (**Note**: 195, 196, 197, 198, 199, and 199H cannot be used towards any mathematics major.) All courses used to fulfill the major must be taken for a letter grade.

It is strongly recommended that all mathematics majors review their programs at least annually with a departmental adviser, and that they consult with the Advising Office in AP&M 6016 before making any changes to their programs. Current course offering information for the entire academic year is maintained on the department's Web page at http://math.ucsd.edu. Special announcements are also emailed to all majors.

Students who plan to go on to graduate school in mathematics should be advised that only the best and most motivated students are admitted. Many graduate schools expect that students will have completed a full sequence of abstract algebra (Math. 100A-B-C) as well as a full sequence of analysis (Math. 140A-B-C). The advanced Graduate Record Exam (GRE) often has questions that pertain to material covered in the last quarter of analysis or algebra. In addition, it is advisable that students consider Summer Research Experiences for Undergraduates. This is a program funded by the National Science Foundation to introduce students to math research while they are still undergraduates. In their senior year or earlier, students should consider taking some graduate courses so that they are exposed to material taught at a higher level. In their junior year, students should begin to think of obtaining letters of recommendation from professors who are familiar with their abilities.

Education Abroad

Students may be able to participate in the UC Education Abroad Program (EAP) and UCSD's Opportunities Abroad Program (OAP) while still making progress towards the major. Students interested in this option should contact the Programs Abroad Office in the International Center and discuss their plans with the mathematics advising officer before going abroad.

The department must approve courses taken abroad. Information on EAP/OAP can be found in the Education Abroad Program section of the *UCSD General Catalog* and the Web site http://orpheus.ucsd.edu/icenter/pao.

Major in Mathematics

The upper-division curriculum provides programs for mathematics majors as well as courses for students who will use mathematics as a tool in the biological, physical and behavioral sciences, and the humanities.

All students majoring in mathematics must complete the basic 20 sequence, Math. 20A-B-C-D-E-F. Math. 109 should be taken in the spring quarter of the sophomore year. All mathematics majors must complete at least thirteen upper-division courses including:

1. 109
2. 140A-B or 142A-B and 120A
   (140A-B-C recommended for graduate school)
3. 100A-B or 103A-B and 102
   (100A-B-C recommended for graduate school)

Upper-division electives to complete the thirteen courses required may be chosen from any mathematics course numbered 100–194.

As with all departmental requirements, more advanced courses on the same material may be substituted with written approval from the departmental adviser.

To be prepared for a strong major curriculum, students should complete the last three quarters of the 20 sequence and Math. 109 before the end of their sophomore year. Either Math. 140A-B or 100A-B should be taken during the junior year.

Major in Applied Mathematics

A major in applied mathematics is also offered. The program is intended for students planning to work on the interface between mathematics and other fields.

All students majoring in applied mathematics are required to complete the following courses:

1. Calculus: 20A-B-C-D-E-F
2. Mathematical Reasoning: 109 (should be taken in sophomore year)
3. Programming:
   MAE 9 (C++) or MAE 10 (Fortran) or
   CSE 8AB (Java) or CSE 11 (Java)
4. Linear Algebra: Math. 102 or 170A.
5. Advanced Calculus: Math. 140A-B or 142A-B
6. One of the following:
   a. 180A-B-C-181A
   b. 180A-181A and any 2 from 181B-C-D-E
   c. (183 or 180A-181A) and any 3 from 170A-B-C-172-173.
7. One additional sequence which may be chosen from the list (#6) above or the following list: 110-120A-130A, 120A-B, 130A-132A, 155A-B, 171A-B, 184A-B, 193A-B.

At least thirteen upper-division courses must be completed in mathematics, except:

a. Up to twelve units may be outside the department in an approved applied mathematical area. A petition specifying the courses to be used must be approved by an applied mathematics adviser. No such units may also be used for a minor or program of concentration.
b. MAE 107, Econ. 120A-B-C, cannot be counted toward the fifty-two units.

To be prepared for a strong major curriculum, students should complete the last three quarters of the 20 sequence and Math. 109 before the end of their sophomore year.

Major in Mathematics–Scientific Computation

This major is designed for students with a substantial interest in scientific computation. The program is a specialized applied mathematics program with a concentration in computer solutions of scientific problems.

Required Courses:

Lower Division

1. Math. 20A-F
2. Computer Programming:
   MAE 9 or MAE 10 and
   CSE 8A-B or CSE 11
3. Basic Computation:
   Math. 15A (or CSE 20) and
   Math. 15B (or CSE 21) and
   CSE 12

Upper Division

4. Mathematical Reasoning: Math. 109
5. Linear Algebra: Math. 102
6. Probability and Statistics: Math. 183 or 180A-181A ***(Note**: No credit for Math. 183 if Math. 180A or 181A taken prior or concurrently.)*
7. Analysis:
   Math. 140A-B or 142A-B ***(Note**: Students planning to go to grad school should take 140A-B)*
8. Numerical Analysis: Math. 170A-B-C or Math. 170A-B/Math. 172
9. Optimization: Math. 171A-B
10. Scientific Computing: Math. 173
11. Additional elective upper-division courses to total 15 chosen from the following:
    Math. 107A-B, 110, 120A-B, 130A-B, 131, 132A-B, 152, 155A-B-C, 170C, or 172.

At least 15 upper-division mathematics courses are required for the major, except:

a. Up to 3 upper-division courses may be taken outside the department in an approved scientific computation area in the sciences or engineering. A petition specifying the courses to be used must be approved by a mathematics-scientific computation adviser. No such units may also be used by a minor or program of concentration.

b. MAE 107, Econ. 120A-B-C, Math. 195, 196, 197, 199, and 199H cannot be counted toward the 13 four-unit upper-division courses.

Major in Mathematics–Applied Science

This major is designed for students with a substantial interest in mathematics and its applications to a particular field such as physics, biology, chemistry, biochemistry, cognitive science, computer science, economics, management science, or engineering.

Required Courses:

1. Math. 20A-B-C-D-E-F
   One of the following is recommended

CSE 8A-B	Intro to Computer Sci: Java
CSE 11	Intro to Computer Sci: Java (Accelerated Pace)
MAE 9	C/C++ Programming
MAE 10	FORTRAN for Engineers

2. Seven upper-division mathematics courses that include:
   a) Math. 109
      and
   b) Math. 102 or Math. 170A
      and
   c) Any two-quarter upper-division math sequence.

Applied Science Requirement:

1. Seven upper-division courses selected from one or two other departments
2. At least three of these seven upper-division courses must require at least Math. 20C as a prerequisite

Students must submit an individual plan for approval in advance by a mathematics department adviser, and all subsequent changes in the plan must be approved by a mathematics department adviser.

Major in Mathematics–Computer Science

The program provides for a major in computer science within the Department of Mathematics. *Graduates of this program will be* mathematically oriented computer scientists who have specialized in the mathematical aspects and foundations of computer science or in the computer applications of mathematics.

As of fall 2000, a mathematics-computer science major is not allowed to also minor in computer science in the Computer Science and Engineering department.

The detailed curriculum is given in the list below:

Mathematics–Computer Science Pre-Major

In October 2001, the Academic Senate approved a mininum GPA requirement of 2.5 in the lower-division mathematics courses required for the mathematics–computer science major. The 2.5 minimum GPA in the lower-division math courses reflects minimal preparation for the upper-division courses required for the major.

Therefore, students entering UCSD as first-year students for the fall 2002 quarter and later and students entering as transfer students for the fall 2003 quarter and later will be held to this requirement. Applications from students entering UCSD on or after the effective dates above will be held until all lower-division math courses for the major are completed and the minimum GPA in those courses of 2.5 can be verified. Students meeting the 2.5 minimum GPA requirement will be accepted into the mathematics–computer science major.

Lower-Division Requirements:

1. Calculus: Math. 20A-B-C-D-E-F
2. Intro to Computer Science—CSE 8A-B Introduction to Computer Science: Java, or CSE 11 Introduction to Computer Science: Java *(Accelerated)*
3. Basic Data Structures and Object-oriented *Programming:* CSE 12
4. Computer Organization and Systems Programming: CSE 30

Upper-Division Requirements:

5. Mathematical Reasoning: Math. 109
6. Modern Applied Algebra: Math. 103AB or Modern Algebra: Math. 100AB
7. Theory of Computability: Math. 166 or CSE 105
8. Intro to Probability: Math. 180A or 183
9. Mathematical Foundations of Computer Science: Math. 184A
10. Computer Implementations of Data Structures: Math. 176 or CSE 100
11. Design & Analysis of Algorithms: Math. 188 (or CSE 101)
12. Eight units from: Math. 170A, B, C, 172, 173, 174 (Note duplication of credit between Math. 174 and 170A-B-C)
13. Eight units from: Math. 107A-B, 152, 155A-B, 160A-B, 166B, 168A-B, 179A-B, 184B, 187, CSE 120-121, 130, 131A-B, 140-140L, 141-141L, 167
14. Eight additional units from: any course in list #12 or #13 above or Math. 102, 110, 111A-B, 120A-B, 130A-B, 131, 132A-B, 140A-B, 142A-B, 150A-B, 165, 181A-B-C

In order to graduate by the end of their senior year, students should complete Math. 103A-B by the end of their junior year.

Joint Major in Mathematics and Economics

Majors in mathematics and the natural sciences often feel the need for a more formal introduction to issues involving business applications of science and mathematics. Extending their studies into economics provides this application and can provide a bridge to successful

careers or advanced study. Majors in economics generally recognize the importance of mathematics to their discipline. Undergraduate students who plan to pursue doctoral study in economics or business need the more advanced mathematics training prescribed in this major.

This major is considered to be excellent preparation for Ph.D. study in economics and business administration, as well as for graduate studies for professional management degrees, including the MBA. The major provides a formal framework making it easier to combine study in the two fields.

Course requirements of the Joint Major in Mathematics and Economics consist principally of the required courses of the pure mathematics major and the economics/management science major.

Lower-Division Requirements:

1. Calculus: Math. 20A-B-C-D-F
2. Intro to Economics: Econ. 1-2-3

Upper-Division Requirements:

Fifteen upper-division courses in mathematics and economics, with a minimum of seven courses in each department, chosen from the courses listed below (prerequisites are strictly enforced):

1. Mathematical Reasoning: Math. 109
2. One of the following:
   Applied Linear Algebra: Math. 102
   Numerical Linear Algebra: Math. 170A
   Modern Algebra: Math. 100AB
3. One of the following:
   Foundations of Analysis: Math. 140A
   Advanced Calculus: Math. 142A
4. One of the following:
   Ordinary Differential Equations: Math. 130A,
   Foundations of Analysis: Math. 140B
   Advanced Calculus: Math. 142B
5. One of the following:
   Microeconomics: Econ. 100A-B or
   Management Science Microeconomics: Econ. 170AB
6. Econometrics: Econ. 120A-B-C or
   Math. 180A and Econ. 120B-C or
   Probability: Math. 180A, 181A and Econ. 120C
7. One of the following:
   Macroeconomics: Econ. 110AB
   Mathematical Programming: Numerical Optimization: Math. 171AB
   or
   Two courses from the following:
   Decisions Under Uncertainty: Econ. 171
   Introduction to Operations Research: Econ. 172A-B-C, (**Note**: 172A is a prerequisite for 172BC)

Other courses which are strongly recommended are: Math. 130B, 131, 181B, 190 and 193AB and Econ. 109, 113, 175, and 178.

Major in Mathematics–Secondary Education

This major offers excellent preparation for teaching mathematics in secondary schools. Students interested in earning a California teaching credential from UCSD should contact the Teacher Education Program (TEP) for information regarding prerequisites and requirements. It is recommended you contact TEP as early as possible.

Lower-Division Requirements

1. Calculus 20A-B-C-D-E-F

Recommended:

1. One of the following:
   Introduction to Computer Science: Java: CSE 8A-B,
   Fortran: MAE 10
   C/C++ Programming: MAE 9

Upper-Division Requirements:

1. Mathematical Reasoning: Math. 109
2. Number Theory: Math 104A
3. History of Mathematics: Math. 163
4. Practicum in Learning: TEP 129A-B-C
5. One of the following:
   Computer Algebra: Math. 107A
   Computer Graphics: Math. 155A
   Numerical Linear Algebra: Math. 170A
   Intro. to Cryptography: Math. 187
   Mathematical Computing: Math. 161
6. One of the following:
   Intro. to Probability: Math. 180A
   Statistical Methods: Math. 183
7. One of the following:
   Differential Geometry: Math. 150A
   Topics in Geometry: Math. 151
   Geometry for Secondary Teachers: Math. 153
   Intro. to Topology: Math. 190
8. One of the Following:
   Modern Algebra: Math. 100A
   Applied Linear Algebra: Math. 102
   Modern Applied Algebra: Math. 103A
9. One of the following:
   Foundations of Analysis: Math. 140A
   Advanced Calculus: Math. 142A
10. Upper-division courses must total thirteen upper-division courses chosen from items 1 to 10. Upper-division courses must include at least one two-quarter sequence from the following list:

    100A-B; 103A-B, 103A-102; 104A-B; 110-120A; 110-130A-B; 110-132A; 110-131; 120A-B; 130A-132A; 130A-B; 140A-B;142A-B; 150A-B; 155A-B; 160A-B; 170A-B; 170A-172; 170A-173; 170A-171A; 171A-B; 180A-B; 180A-181A; 184A-B; 193A-B.

Minor in Mathematics

The minor in mathematics consists of seven or more courses. At least four of these courses must be upper-division courses taken from the UCSD Department of Mathematics. Acceptable lower-division courses are Math. 20D, 20E, and 20F.

Math. 195, 196, 197, 198, 199, and 199H are not acceptable courses for the mathematics minor. A grade of C– or better (or P if the Pass/No Pass option is used) is required for all courses used to satisfy the requirements for a minor. There is no restriction on the number of classes taken with the P/NP option. Upper-division courses cannot overlap between major and minor programs.

Mathematics Honors Program

The Department of Mathematics offers an honors program for those students who have demonstrated excellence in the major. Successful completion of the honors program entitles the student to graduate with departmental honors (see Department Honors in the Academic Regulations section). Application to the program should be made the spring quarter before the student is at senior standing.

Requirements for admission to the program are:

1. Junior standing
2. An overall GPA of 3.0 or higher
3. A GPA in the major of 3.5 or higher
4. Completion of Math. 109 (Mathematical Reasoning) and at least one of Math. 100A,

103A, 140A, or 142A. (Completion of additional major courses is strongly recommended.)

Completion of the honors program requires the following:

1. At least one quarter of the student colloquium, Math. 196 (**Note:** Math. 196 is only offered in the fall quarter.)
2. The minimum 3.5 GPA in the major must be maintained
3. An Honors Thesis. The research and writing of the thesis will be conducted over at least two quarters of the junior/senior years under the supervision of a faculty adviser. This research will be credited as eight to twelve units of Math. 199H. The completed thesis must be approved by the department's Honors Committee, and presented orally at the Undergraduate Research Conference or another appropriate occasion.

The department's Honors Committee will determine the level of honors to be awarded, based on the student's GPA in the major and the quality of the honors work. Applications for the mathematics department's Honors Program can be obtained at the mathematics department Undergraduate Affairs Office (AP&M 7018) or the Mathematics Advising Office (AP&M 6016). Completed applications can be returned to the Mathematics Advising Office.

Duplication of Credit

In the circumstances listed below, a student will not receive full credit for a Department of Mathematics course. The notation "Math. 20A [2 if Math. 10A previously/0 if Math. 10A concurrently/0 if Math. 10B or 10C]" means that a student already having credit for Math. 10A will receive only two units of credit for Math. 20A, but will receive no units if he or she has credit for Math. 10B or 10C, and no credit will be awarded for Math. 20A if Math. 10A is being taken concurrently.

1. Math. 4C [0 if Math. 10A or Math. 20A previously or concurrently]
2. Math. 15A [0 if CSE20]
   Math. 15B [0 if CSE21]
3. Math. 20A [2 if Math. 10A previously/0 if Math. 10A concurrently/0 if Math. 10B or 10C]
4. Math. 20B [2 if Math. 10B or 10C previously/0 if Math. 10B concurrently]
5. Math. 20C [2 if Math. 10C previously/0 if Math. 10C concurrently]
6. Math. 20D [2 if Math. 20D previously/0 if Math. 2DA previously]
7. Math. 20E [0 if Math. 2F previously]
8. Math. 20F [0 if Math. 2EA previously]
9. Both Math. 100 and Math. 103 cannot be taken for credit
10. Math. 142A-B [0 if Math. 140A-B]
11. Math. 155A [0 if CSE 167]
12. Math. 166 [0 if CSE105]
13. Math. 174 [0 if 170A or B or C previously]
14. Math. 180A [2 if Econ. 120A previously/0 if Econ. 120A concurrently]
15. Math. 181A [2 if Econ. 120B/0 if Econ. 120B concurrently]
16. Math. 183 [0 if Econ. 120A or Math. 180A or Math. 181A has been taken previously or concurrently. Full credit for Math. 183 will be given if taken previously to Math. 180A or Math. 181A.]

For duplication or repeat of credit guidelines between the Math. 20 sequence and the Math. 10 sequence, refer to the section titled "First-Year Courses."

Advisers

Advisers change yearly. Contact the undergraduate office at (858) 534-3590 for current information.

The Graduate Program

The Department of Mathematics offers graduate programs leading to the M.A. (pure or applied mathematics), M.S. (statistics), and Ph.D. degrees.

The application deadline for fall admission is January 15. Candidates should have a bachelor's or master's degree in mathematics or a related field from an accredited institution of higher education or the equivalent. A minimum scholastic average of B or better is required for course work completed in upper-division or prior graduate study. In addition, the department requires all applicants to submit scores no older than twelve months from both the GRE General Test and Advanced Subject Test in Mathematics. Completed files are judged on the candidate's mathematical background, qualifications, and goals.

Departmental support is typically in the form of teaching assistantships, research assistantships, and fellowships. These are currently only awarded to students in the Ph.D. program.

General Requirements

All student course programs must be approved by a faculty adviser prior to registering for classes each quarter, as well as any changes throughout the quarter.

Full-time students are required to register for a minimum of twelve (12) units every quarter, eight (8) of which must be graduate-level mathematics courses taken for a letter grade only. The remaining four (4) units can be approved upper-division or graduate-level courses in mathematics-related subjects *(Math. 500 may not be used to satisfy any part of this requirement).* After advancing to candidacy, Ph.D.
candidates may take all course work on a Satisfactory/Unsatisfactory basis. Typically, students should not enroll in Math. 299 until they have satisfactorily passed both qualifying examinations *(see Ph.D. in Mathematics)* or obtained approval of their faculty adviser.

Master of Arts in Pure Mathematics

[*Offered only under the Comprehensive Examination Plan.*] The degree may be terminal or obtained on the way to the Ph.D. A total of forty-eight units of credit is required. Twenty-four of these units must be graduate-level mathematics courses approved in consultation with a faculty adviser.

In the selection of course work to fulfill the remaining twenty-four units, the following restrictions must be followed:

a. No more than eight units of upper-division mathematics courses.
b. No more than twelve units of graduate courses in a related field outside the department (approved by the Department of Mathematics).
c. No more than four units of Math. 295 (Special Topics) or Math. 500 (Apprentice Teaching).
d. No units of Math. 299 (Reading and Research) may be used in satisfying the requirements for the master's degree.

COMPREHENSIVE EXAMINATIONS

Seven written departmental examinations are offered in three areas (refer to "Ph.D. in Mathematics," Areas 1, 2, and 3, for list of exams). A student must complete two examinations, one from Area 1 and one from Area 2, both with an M.A. pass or better.

FOREIGN LANGUAGE REQUIREMENT

A reading knowledge of one foreign language (French, German, or Russian) is required. In exceptional cases other languages may be substituted. Testing is administered by faculty in the department who select published mathematical material in one of these languages for a student to translate.

TIME LIMITS

Full-time students are permitted seven quarters in which to complete all degree requirements. While there are no written time limits for part-time students, the department has the right to intervene and set individual deadlines if it becomes necessary.

Master of Arts in Applied Mathematics

[*Offered only under the Comprehensive Examination Plan*] The degree may be terminal or obtained on the way to the Ph.D. Out of the total forty-eight units of required credit, two applied mathematics sequences comprising twenty-four units must be chosen from the following list (not every course is offered each year):

202A-B-C.	(Applied Algebra)
210A-B-C.	(Mathematical Methods in Physics and Engineering)
261A-B-C.	(Combinatorial Algorithms)
264A-B-C.	(Combinatorics)
270A-B-C.	(Numerical Mathematics)
271A-B-C.	(Numerical Optimization)
272A-B-C.	(Numerical Partial Differential Equations)
273A-B-C.	(Scientific Computation)

In certain cases, a petition may be approved to substitute one of these requirements from the following list of sequences:

220A-B-C.	(Complex Analysis)
231A-B-C.	(Partial Differential Equations)
240A-B-C.	(Real Analysis)
280A-B-C.	(Probability Theory)
281A-B-C.	(Mathematical Statistics)
282A-B.	(Applied Statistics)

In choosing course work to fulfill the remaining twenty-four units, the following restrictions must be followed:

a. At least eight units must be approved graduate courses in mathematics or other departments [a one-year sequence in a related area outside the department such as computer science, engineering, physics, or economics is strongly recommended];
b. A maximum of eight units can be approved upper-division courses in mathematics; and
c. A maximum of eight units can be approved upper-division courses in other departments.
d. A maximum of four units of Math. 500 (Apprentice Teaching).
e. NO UNITS of Math. 295 (Special Topics) or Math. 299 (Reading and Research) may be used.

Students are strongly encouraged to consult with a faculty adviser in their first quarter to prepare their course of study.

COMPREHENSIVE EXAMINATIONS

Two written comprehensive examinations must be passed at the master's level in any of the required applied mathematics sequences listed above. The instructors of each course should be contacted for exam details.

FOREIGN LANGUAGE REQUIREMENT

There is no foreign language requirement for the M.A. in applied mathematics.

TIME LIMITS

Full-time M.A. students are permitted seven quarters in which to complete all requirements. While there are no written time limits for part-time students, the department has the right to intervene and set individual deadlines if it becomes necessary.

Master of Science in Statistics

[*Offered only under the Comprehensive Examination Plan*] The M.S. in statistics is designed to provide recipients with a strong mathematical background and experience in statistical computing with various applications. Out of the forty-eight units of credit needed, required core courses comprise twenty-four units, including:

Math. 281A-B. (Mathematical Statistics)
Math. 282A-B. Applied Statistics)

and any two topics comprising eight units chosen at will from Math. 287A-B-C-D and 289A-B-C (see course descriptions for topics).

The following guidelines should be followed when selecting courses to complete the remaining twenty-four units:

a. For a theoretical emphasis, Math. 280A-B-C (Probability Theory) is required.
b. For an applied orientation, Math. 270A-B-C (Numerical Mathematics) is recommended.
c. A maximum of eight units of approved upper-division applied mathematics courses (see faculty adviser) and Math. 500 (Apprentice Teaching).

Upon the approval of the faculty adviser, all twenty-four units can be graduate-level courses in other departments.

COMPREHENSIVE EXAMINATIONS

Two written comprehensive examinations must be passed at the master's level in related course work (approved by a faculty adviser). Instructors of the relevant courses should be consulted for exam dates as they vary on a yearly basis.

FOREIGN LANGUAGE REQUIREMENT

There is no foreign language requirement for the M.S. in statistics.

TIME LIMITS

Full-time M.S. students are permitted seven quarters in which to complete all requirements. While there are no written time limits for part-time students, the department has the right to intervene and set individual deadlines if it becomes necessary.

Ph.D. in Mathematics

WRITTEN QUALIFYING EXAMINATIONS

The department offers written qualifying examinations in seven subjects. These are grouped into three areas as follows:

Area #1

Complex Analysis (Math. 220A-B-C)
Real Analysis (Math. 240A-B-C)

Area #2

Algebra (Math. 200A-B-C)
Applied Algebra (Math. 202A-B-C)
Topology (Math. 290A-B-C)

Area #3

Numerical Analysis (Math. 270A-B-C)
Statistics (Math. 281A-B-C)

i) Three qualifying exams must be passed. At least one must be passed at the Ph.D. level, and a second must be passed at either the Ph.D. or Provisional Ph.D. level. The third exam must be passed at least at the master's level.

ii) Of the three qualifying exams, there must be at least one from each of Areas #1 and #2. Algebra and Applied Algebra do not count as distinct exams in Area #2.

iii) Students must pass a least two exams from distinct areas with a minimum grade of Provisional Ph.D. (For example, a Ph.D. pass in Real Analysis, Provisional Ph.D. pass in Complex Analysis, M.A. pass in Algebra would NOT satisfy this requirement, but a Ph.D. pass in Real Analysis, M.A. pass in Complex Analysis, Provisional Ph.D. pass in Algebra would, as would a Ph.D. pass in Numerical Analysis, Provisional Ph.D. pass in Applied Algebra, and M.A. pass in Real Analysis.)

iv) All exams must be passed by the September exam session prior to the beginning of the third year of graduate studies. (Thus, there would be no limit on the number of attempts, encouraging new students to take exams when they arrive, without penalty.)

Department policy stipulates that a least one of the exams must be completed with a Provisional Ph.D. pass or better by September following the end of the first year. Anyone unable to comply with this schedule will be terminated from the doctoral program and transferred to one of our Master's programs.

Any Master's student can submit for consideration a written request to transfer into the Ph.D. program when the qualifying exam requirements for the Ph.D. program have been met and a dissertation adviser is found. Approval by the Qualifying Exam and Appeals Committee (QEAC) is not automatic, however.

Exams are typically offered twice a year, one scheduled late in the spring quarter and again in early September (prior to the start of fall quarter). Copies of past exams are made available for purchase in the Graduate Office.

In choosing a program with an eye to future employment, students should seek the assistance of a faculty adviser and take a broad selection of courses including applied mathematics, such as those in Area #3.

FOREIGN LANGUAGE REQUIREMENT

A reading knowledge of one foreign language (French, German, or Russian) is required prior to advancing to candidacy. In exceptional cases other languages may be substituted. Testing is administered within the department by faculty who select published mathematical material in one of these languages for a student to translate.

ADVANCEMENT TO CANDIDACY

It is expected that by the end of the third year (nine quarters), students should have a field of research chosen and a faculty member willing to direct and guide them. A student will advance to candidacy after successfully passing the oral qualifying examination, which deals primarily with the area of research proposed but may include the project itself. This examination is conducted by the student's appointed doctoral committee. Based on their recommendation, a student advances to candidacy and is awarded the C.Phil. degree.

DISSERTATION AND FINAL DEFENSE

Submission of a written dissertation and a final examination in which the thesis is publicly defended are the last steps before the Ph.D. degree is awarded. When the dissertation is substantially completed, copies must be provided to all committee members at least four weeks in advance of the proposed defense date. Two weeks before the scheduled final defense, a copy of the dissertation must be made available in the department for public inspection.

TIME LIMITS

The normative time for the Ph.D. in mathematics is five years. Students must be advanced to candidacy by the end of eleven quarters. Total university support cannot exceed six years. Total registered time at UCSD cannot exceed seven years.

COURSES

All prerequisites listed below may be replaced by an equivalent or higher-level course. The listings of quarters in which courses will be offered are only tentative. Please consult the Department of Mathematics to determine the actual course offerings each year.

LOWER-DIVISION

3C. Pre-Calculus (4)
Functions and their graphs. Linear and polynomial functions, zeroes, inverse functions, exponential and logarithm, trigonometric functions and their inverses. Emphasis on understanding algebraic, numerical and graphical approaches making use of graphing calculators. (No credit given if taken after Math. 4C, 1A/10A, or 2A/20A.) *Prerequisite: two or more years of high school mathematics or equivalent.*

4C. Pre-Calculus for Science and Engineering (4)
Review of polynomials. Graphing functions and relations: graphing rational functions, effects of linear changes of coordinates. Circular functions and right triangle trigonometry. Reinforcement of function concept: exponential, logarithmic, and trigonometric functions. Vectors. Conic sections. Polar coordinates. Three lectures, one recitation. (No credit given if taken after Math. 1A/10A or 2A/20A. Two units of credit given if taken after Math. 3C.) *Prerequisite: Math Placement Exam qualifying score, or Math. 3C with a grade of C or better.*

10A. Calculus (4)
Differentiation and integration of algebraic functions. Fundamental theorem of calculus. Applications. (No credit given if taken after Math. 2A/20A. Formerly numbered Math. 1A.) *Prerequisites: Math Placement Exam qualifying score, or AP Calculus AB score of 2, or SAT II Math. 2C score of 650 or higher, or Math. 3C with a grade of C or better, or Math. 4C with a grade of C– or better.*

10B. Calculus (4)
Further applications of the definite integral. Calculus of trigonometric, logarithmic, and exponential functions. Complex numbers. (No credit given if taken after Math. 2B/20B. Formerly numbered Math. 1B.) *Prerequisites: AP Calculus AB score of 3, 4, or 5, or Math. 10A with a grade of C– or better, or Math. 20A with a grade of C– or better.*

10C. Calculus (4)
Vector geometry, velocity, and acceleration vectors. (No credit given if taken after Math. 2C/20C. Formerly numbered Math. 1C.) *Prerequisites: AP Calculus BC score of 3, 4, or 5, or Math. 10B with a grade of C– or better, or Math. 20B with a grade of C– or better.*

11. Elementary Probability and Statistics (4)
Events and probabilities, combinatorics, conditional probability, Bayes formula. Discrete random variables: mean, variance; binomial, multinomial, Poisson distributions. Continuous random variables: densities, mean, variance; normal, uniform, exponential distributions. Sample statistics, confidence intervals, regression. Applications. Intended for biology and social science majors. *Prerequisites: Math. 10A-B or Math. 20A-B.*

15A. Discrete Mathematics (4)
Basic discrete mathematical structures: sets, relations, functions, sequences, equivalence relations, partial orders, number systems. Methods of reasoning and proofs: propositional logic, predicate logic, induction, recursion, pigeonhole principle. Infinite sets and diagonalization. Basic counting techniques; permutations and combinations. Applications will be given to digital logic design, elementary number theory, design of programs, and proofs of program correctness. Equivalent to CSE 20. Credit not offered for both Math. 15A and CSE 20. *Prerequisites: CSE 8A or CSE 8B or CSE 11. CSE 8B or CSE 11 may be taken concurrently with Math. 15A/CSE 20.*

15B. Mathematics for Algorithm and Systems (4)
This course introduces mathematical tools for the qualitative and quantitative analysis of algorithms and computer systems. Topics to be covered include basic enumeration and counting techniques; recurrence relations; graph theory; asymptotic notation; elementary applied discrete probability. Equivalent to CSE 21. *Prerequisite: Math. 15A or CSE 20 or 160A; CSE 12 is strongly recommended for CSE 21.*

18. Computer Animated Statistics (4)
Students will acquire the basics of statistical analysis by working with computer-simulated models rather than abstract mathematical language. Topics include hypothesis testing, maximum likelihood estimation, sampling, chi-square tests and construction of confidence intervals. *Prerequisite: Math. 1B or 10B or 20B.*

20A. Calculus for Science and Engineering (4)
Foundations of differential and integral calculus of one variable. Functions, graphs, continuity, limits, derivative, tangent line. Applications with algebraic, exponential, logarithmic, and trigonometric functions. Introduction to the integral. (Two credits given if taken after Math. 1A/10A and no credit given if taken after Math. 1B/10B or Math. 1C/10C. Formerly numbered Math. 2A.) *Prerequisite: Math Placement Exam qualifying score, or AP Calculus AB score of 2 or 3, or SAT II Math. 2C score of 650 or higher, or Math. 4C with a grade of B or better, or Math. 10A with a grade of C– or better.*

20B. Calculus for Science and Engineering (4)
Integral calculus of one variable and its applications, with exponential, logarithmic, hyperbolic, and trigonometric functions. Methods of integration. Polar coordinates in the plane. (Two units of credits given if taken after Math. 1B/10B or Math. 1C/10C.) *Prerequisite: AP Calculus AB score of 3, 4, or 5, or AP Calculus BC score of 3, or Math. 20A with a grade of C– or better, or Math. 10B with a grade of C– or better, or Math. 10C with a grade of C– or better.*

20C. Calculus and Analytic Geometry for Science and Engineering (4)
Vector geometry, vector functions and their derivatives. Partial differentiation. Maxima and minima. Double integration, Two units of credit given if taken after Math. 10C. Formerly numbered Math. 21C. *Prerequisite: AP Calculus BC score of 3, 4, or 5, or Math. 20B with a grade of C– or better.*

20D. Introduction to Differential Equations (4)
Infinite series. Ordinary differential equations: exact, separable, and linear; constant coefficients, undetermined coefficients, variations of parameters. Series solutions. Systems, Laplace transforms, technique for engineering sciences. Computing symbolic and graphical solutions using Matlab. Formerly numbered Math. 21D. May be taken as repeat credit for Math. 21D. *Prerequisite: Math. 20C or equivalent or consent of instructor.*

20E. Vector Calculus (4)
Change of variable in multiple integrals, Jacobian Line integrals, Green's theorem. Vector fields, gradient fields, divergence, curl. Spherical and cylindrical coordinates. Taylor series in several variables. Surface integrals, Stoke's theorem. Gauss' theorem and its applications. Conservative fields. (Zero units given if Math. 2F previously. Formerly numbered Math. 2F) *Prerequisite: Math. 20C (or 21C) or equivalent, or consent of instructor.*

20F. Linear Algebra (4)
Matrix algebra, solution of systems of linear equations by Gaussian elimination, determinants. Linear and affine subspaces, bases of Euclidean spaces. Eigenvalues and eigenvectors, quadratic forms, orthogonal matrices, diagonalization of symmetric matrices. Applications. Computing symbolic and graphical solutions using Matlab. (Zero units given if Math. 2EA previously. Formerly numbered 2EA.) *Prerequisite: Math. 20C (or 21C) or equivalent or consent of instructor.*

87. Freshman Seminar (1)
The Freshman Seminar Program is designed to provide new students with the opportunity to explore an intellectual topic with a faculty member in a small seminar setting. Freshman seminars are offered in all campus departments and undergraduate colleges, and topics vary from quarter to quarter. Enrollment is limited to 15 to 20 students, with preference given to entering freshman. *Prerequisite: none.*

UPPER-DIVISION

100A-B-C. Modern Algebra (4-4-4)
An introduction to the methods and basic structures of higher algebra: sets and mappings, the integers, rational, real and complex numbers, groups, rings (especially polynomial rings) and ideals, fields, real and complex vector spaces, linear transformations, inner product spaces, matrices, triangular form, diagonalization. Both 100 and 103 cannot be taken for credit. Three lectures, one recitation. *Prerequisites: Math. 20F, and Math. 109 or consent of instructor.* (F,W,S)

102. Applied Linear Algebra (4)
A second course in linear algebra from a computational yet geometric point of view. Elementary Hermitian matrices, Schur's theorem, normal matrices, and quadratic forms. Moore-Penrose generalized inverse and least square problems. Vector and matrix norms. Characteristic and singular values. Canonical forms. Determinants and multilinear algebra. Three lectures, one recitation. *Prerequisite: Math. 20F.* (W)

103A-B. Modern Applied Algebra (4-4)
Abstract algebra with applications to computation. Set algebra and graph theory. Finite state machines. Boolean algebras and switching theory. Lattices. Groups, rings and fields: applications to coding theory. Recurrent sequences. Three lectures, one recitation. Both 100 and 103 cannot be taken for credit. *Prerequisites: Math. 20F and Math. 109 (may be taken concurrently).* (F,W)

104A-B-C. Number Theory (4-4-4)
Topics from number theory with applications and computing. Possible topics are: congruences, reciprocity laws, quadratic forms, prime number theorem, Riemann zeta function, Fermat's conjecture, diophantine equations, Gaussian sums, algebraic integers, unique factorization into prime ideals in algebraic number fields, class number, units, splitting of prime ideals in extensions, quadratic and cyclotomic fields, partitions. Possible applications are Fast Fourier Transform, signal processing, coding, cryptography. Three lectures. *Prerequisite: consent of instructor.*

107A-B. Computer Algebra (4)
An introduction to algebraic computation. Computational aspects of groups, rings, fields, etc. Data representation and algorithms for symbolic computation. Polynomials and their arithmetic. The use of a computer algebra system as an experimental tool in mathematics. Programming using algebra systems. *Prerequisite: prior or concurrent enrollment in the Math. 100 or 103 sequence.*

109. Mathematical Reasoning (4)
This course uses a variety of topics in mathematics to introduce the students to rigorous mathematical proof, emphasizing quantifiers, induction, negation, proof by contradiction, naive set theory, equivalence relations and epsilon-delta proofs. Required of all departmental majors. *Prerequisite: Math. 20F.*

110. Introduction to Partial Differential Equations (4)
Fourier series, orthogonal expansions, and eigenvalue problems. Sturm-Liouville theory. Separation of variables for partial differential equations of mathematical physics, including topics on Bessel functions and Legendre polynomials. *Prerequisites: Math. 20D (or 21D) and 20F, or consent of instructor.* (F,S)

111A-B. Mathematical Modeling (4-4)
An introduction to mathematical modeling in the physical and social sciences, concentrating on one or more topics that vary from year to year. Students work on independent or group projects. May be repeated for credit when topics change. *Prerequisites: Math. 20D and Math. 20F, or consent of instructor.*

120A. Elements of Complex Analysis (4)
Complex numbers and functions. Analytic functions, harmonic functions, elementary conformal mappings. Complex integration. Power series. Cauchy's theorem. Cauchy's formula. Residue theorem. Three lectures, one recitation. *Prerequisite or co-registration: Math. 20E, or consent of instructor.* (F,W)

120B. Applied Complex Analysis (4)
Applications of the Residue theorem. Conformal mapping and applications to potential theory, flows, and temperature distributions. Fourier transformations. Laplace transformations, and applications to integral and differential equations. Selected topics such as Poisson's formula. Dirichlet problem. Neumann's problem, or special functions. Three lectures, one recitation. *Prerequisite: Math. 120A.* (W,S)

130A. Ordinary Differential Equations (4)
Linear and nonlinear systems of differential equations. Stability theory, perturbation theory. Applications and introduction to numerical solutions. Three lectures. *Prerequisites: Math. 20D/21D and 20F.* (F)

130B. Ordinary Differential Equations (4)
Existence and uniqueness of solutions to differential equations. Local and global theorems of continuity and differentiabillity. Three lectures. *Prerequisites: Math. 20D/21D and 20F, and Math. 130A.* (W)

131. Variational Methods in Optimization (4)
Maximum-minimum problems. Normed vector spaces, functionals, Gateaux variations. Euler-Lagrange multiplier theorem for an extremum with constraints. Calculus of variations via the multiplier theorem. Applications may be taken from a variety of areas such as the following: applied mechanics, elasticity, economics, production planning and resource allocation, astronautics, rocket control, physics, Fermat's principle and Hamilton's principle, geometry, geodesic curves, control theory, elementary bang-bang problems. Three lectures, one recitation. *Prerequisites: Math. 20D/21D and 20F or consent of instructor.* (S)

132A. Elements of Partial Differential Equations and Integral Equations (4)
Basic concepts and classification of partial differential equations. First order equations, characteristics. Hamilton-Jacobi theory, Laplace's equation, wave equation, heat equation. Separation of variables, eigenfunction expansions, existence and uniqueness

of solutions. Three lectures. *Prerequisite: Math. 110 or consent of instructor.* (W)

132B. Elements of Partial Differential Equations and Integral Equations (4)
Relation between differential and integral equations, some classical integral equations, Volterra integral equations, integral equations of the second kind, degenerate kernels, Fredholm alternative, Neumann-Liouville series, the resolvent kernel. Three lectures. *Prerequisite: Math. 132A.* (S)

140A-B-C. Foundations of Analysis (4-4-4)
Axioms, the real number system, topology of the real line, metric spaces, continuous functions, sequences of functions, differentiation, Riemann-Stieltjes integration, partial differentiation, multiple integration, Jacobians. Additional topics at the discretion of the instructor: power series, Fourier series, successive approximations of other infinite processes. Three lectures, one recitation. *Prerequisites: Math. 20F and Math. 109 or consent of instructor.* Credit cannot be obtained for both Math. 140A-B and 142A-B. (F,W,S)

142A-B. Advanced Calculus (4-4)
The number system. Functions, sequences, and limits. Continuity and differentiability. The Riemann integral. Transcendental functions. Limits and continuity. Infinite series. Sequences and series of functions. Uniform convergence. Taylor series. Improper integrals. Gamma and Beta functions. Fourier series. Three lectures. *Prerequisites: Math. 20F and Math. 109 (concurrent enrollment in Math. 109 allowed.)* Credit cannot be obtained for both Math. 140A-B and 142A-B.

150A. Differential Geometry (4)
Differential geometry of curves and surfaces. Gauss and mean curvatures, geodesics, parallel displacement, Gauss-Bonnet theorem. Three lectures. *Prerequisite: Math. 20E or consent of instructor.* (F)

150B. Calculus on Manifolds (4)
Calculus of functions of several variables, inverse function theorem. Further topics, selected by instructor, such as exterior differential forms, Stokes' theorem, manifolds, Sard's theorem, elements of differential topology, singularities of maps, catastrophes, further topics in differential geometry, topics in geometry of physics. Three lectures. *Prerequisite: Math. 150A.* (W)

151. Topics in Geometry (4)
A topic, selected by the instructor, from Euclidean geometry, non-Euclidean geometry, projective geometry, algebraic geometry, or other geometries. May be repeated for credit with a different topic. Three lectures. *Prerequisite: consent of instructor.* (S)

152. Applicable Mathematics and Computing (4)
This course will give students experience in applying theory to real world applications such as Internet and wireless communication problems. The course will incorporate talks by experts from industry and students will be helped to carry out independent projects. Topics include graph visualization, labelling, and embeddings, random graphs and randomized algorithms. May be taken 3 times for credit. *Prerequisites: Math. 20D or 21D, and 20F or consent of instructor.*

153. Geometry for Secondary Teachers (4)
Two- and three-dimensional Euclidean geometry is developed from one set of axioms. Pedagogical issues will emerge from the mathematics and be addressed using current research in teaching and learning geometry. This course is designed for prospective secondary school mathematics teachers. *Prerequisite: Math. 109.*

155A. Computer Graphics (4)
Bezier curves and control lines, de Casteljau construction for subdivision, elevation of degree, control points of Hermite curves, barycentric coordinates, rational curves. Three lectures, one recitation, and approximately eight laboratory hours per week. *Prerequisites: Math. 20F and programming experience.* [Warning: There are duplicate credit restrictions on this course. See section on Duplication of Credit.] (F)

155B. Topics in Computer Graphics (4)
Spline curves, spline interpolation, affine and affine cross ratios, polar forms (blossoming), the Oslo algorithm for knot insertion, NURBS and geometric continuity. Three lectures, one recitation, and approximately eight laboratory hours per week. *Prerequisite: Math. 155A or consent of instructor.* (W)

160A-B. Elementary Mathematical Logic (4-4)
An introduction to recursion theory, set theory, proof theory, and model theory. Turing machines. Undecidability of arithmetic and predicate logic. Proof by induction and definition by recursion. Cardinal and ordinal numbers. Completeness and compactness theorems for propositional and predicate calculi. Three lectures. *Prerequisite: Math. 100A, 103A, 140A, or consent of instructor.*

161. Mathematical Computing (2 or 4)
Programming in higher level mathematical language such as Mathematica: Lists, Functions, Expressions, Recursion, Iteration, graphics, packages. Application to diverse areas of mathematics such as differential equations, dynamical systems, fractals, chaos, probability, financial models. *Prerequisite: Math. 20A-B, 21C-D, 20E-F or equivalent.*

163. History of Mathematics (4)
Topics will vary from year to year in areas of mathematics and their development. Topics may include the evolution of mathematics from the Babylonian period to the eighteenth century using original sources, a history of the foundations of mathematics and the development of modern mathematics. *Prerequisite: Math. 20B or consent of instructor.* (S)

165. Introduction to Set Theory (4)
Sets, relations, and functions. Partial, linear, and well-orders. The axiom of choice, proof by induction and definition by recursion. Cardinal and ordinal numbers and their arithmetic. *Prerequisite: Math. 100A or 140A or 103, or consent of instructor.*

166. Intro to the Theory of Computation (4)
Introduction to formal languages; regular languages; regular expressions, finite automata, minimization, closure properties, decision algorithms, and non-regular languages; context-free languages, context-free grammars, push-down automata, parsing theory, closure properties, and noncontext-free languages; computable languages; turing machines, recursive functions, Church's thesis, undecidability and the halting problem. Equivalent to CSE 105. *Prerequisites: CSE 8B or 9B or 10 or 65 or 62B AND CSE 20 or 160A or Math. 15A or 109 or 100A or 103A.*

168A. Topics in Applied Mathematics-Computer Science (4)
Topics to be chosen in areas of applied mathematics and mathematical aspects of computer science. May be repeated once for credit with different topics. Three lectures, one recitation. *Prerequisite: consent of instructor.* (W,S)

170A. Numerical Linear Algebra (4)
Analysis of numerical methods for linear algebraic systems and least squares problems. Orthogonalization methods. Ill conditioned problems. Eigenvalue and singular value computations. Three lectures, one recitation. *Prerequisites: Math. 20F and knowledge of programming.* (F,S)

170B. Numerical Analysis (4)
Rounding and discretization errors. Calculation of roots of polynomials and nonlinear equations. Interpolation. Approximation of functions. Three lectures, one recitation. *Prerequisites: Math. 20F and knowledge of programming.* (W)

170C. Numerical Ordinary Differential Equations (4)
Numerical differentiation and integration. Ordinary differential equations and their numerical solution. Basic existence and stability theory. Difference equations. Boundary value problems. Three lectures, one recitation. *Prerequisite: Math. 170B or consent of instructor.* (S)

171A-B. Mathematical Programming–Numerical Optimization (4-4)
Mathematical optimization and applications. Linear programming, the simplex method, duality. Nonlinear programming, Kuhn-Tucker theorem. Selected topics from integer programming, network flows, transportation problems, inventory problems, and other applications. Three lectures, one recitation. *Prerequisites: Math. 20F and knowledge of programming.*

172. Numerical Partial Differential Equations (4)
Finite difference methods for the numerical solution of hyperbolic and parabolic partial differential equations; finite difference and finite element methods for elliptic partial differential equations. Three lectures. *Prerequisites: Math. 170A or Math. 110 and programming experience.* (S)

173. Mathematical Software–Scientific Programming (4)
Development of high quality mathematical software for the computer solution of mathematical problems. Three lectures, one recitation. *Prerequisites: Math. 170A or Math. 174 and knowledge of FORTRAN.* (W)

174. Numerical Methods in Science and Engineering (4)
Floating point arithmetic, linear equations, interpolation, integration, differential equations, nonlinear equations, optimization, least squares. Students may not receive credit for both Math. 174 and Physics 105 or MAE 153 or 154. Students may not receive credit for Math. 174 if Math. 170 A,B, or C has already been taken. *Prerequisites: Math. 20D (21D) and Math. 20F.*

176. Advanced Data Structures (4)
Descriptive and analytical presentation of data structures and algorithms. Lists, tables, priority queues, disjoint subsets, and dictionaries data types. Data structuring techniques include linked lists, arrays, hashing, and trees. Performance evaluation involving worst case, average and expected case, and amortized analysis. Crecit not offered for both Math. 176 and CSE 100. Equivalent to CSE 100. *Prerequisites: CSE 12, CSE 21, or Math. 15B, and CSE 30, or consent of instructor.*

180A. Introduction to Probability (4)
Probability spaces, random variables, independence, conditional probability, distribution, expectation, joint distributions, central-limit theorem. Three lectures. *Prerequisites: Math. 20D/21D.* [Warning: There are duplicate credit restrictions on this course. See section on Duplication of Credit.] (F)

180B. Introduction to Probability (4)
Random vectors, multivariate densities, covariance matrix, multivariate normal distribution. Random walk, Poisson process. Other topics if time permits. Three lectures. *Prerequisites: Math. 180A and Math. 20E.* (W)

180C. Introduction to Probability (4)
Markov chains in discrete and continuous time, random walk, recurrent events. If time permits, topics chosen from stationary normal processes, branching processes, queuing theory. Three lectures. *Prerequisite: Math. 180B.* (S)

181A. Introduction to Mathematical Statistics (4)
Random samples, linear regression, least squares, testing hypotheses, and estimation. Neyman-Pearson lemma, likelihood ratios. Three lectures, one recitation. *Prerequisites: Math. 180A and 20F.* [Warning: There are duplicate credit restrictions on this course. See section on Duplication of Credit.] (W)

181B. Introduction to Mathematical Statistics (4)
Goodness of fit, special small sample distribution and use, nonparametric methods. Kolmogorov-Smirnov statistics, sequential analysis. Three lectures. *Prerequisite: Math. 181A.* (S)

181C. Mathematical Statistics (4)
Nonparametric Statistics. Topics covered may include the following: Classical rank test, rank correlations, permutation tests, distribution free testing, efficiency, confidence intervals, nonparametric regression and density estimation, resampling techniques (bootstrap, jackknife, etc.) and cross validations. *Prerequisites: Math. 181A, 181B previously or concurrently.*

181D. Mathematical Statistics (4)
Sampling Theory. Basic notions of estimation: bias, variance, and sampling errors. Sampling from finite populations: simple random, stratified, cluster, sampling with unequal probabilities. Ratio and regression estimaters, multistage sampling. *Prerequisites: Math. 181A, 181B previously or concurrently.*

181E. Mathematical Statistics (4)
Time Series. Analysis of trends and seasonal effects, autoregressive and moving averages models, forecasting, informal introduction to spectral analysis. *Prerequisites: Math. 181A, 181B previously or concurrently.*

182. Introduction to Combinatorics (4)
Combinatorial methods and their computer implementation. Permutations and combinations, generating functions, partitions, principle of inclusion and exclusion. Polya's theory of counting. Hall's theorem, assignment problem, backtrack technique, error-correcting codes, combinatorial optimization problems. Three lectures, one recitation. *Prerequisites: Math. 20F and programming experience.* (W)

183. Statistical Methods (4)
Introduction to probability. Discrete and continuous random variables–binomial, Poisson and Gaussian distributions. Central limit theorem. Data analysis and inferential statistics: graphical techniques, confidence intervals, hypothesis tests, curve fitting. (Credit not offered for Math. 183 if Econ. 120A, Math. 180A, or Math. 181A previously or concurrently.) *Prerequisite: Math. 20C (21C).* (F,S)

184A. Mathematical Foundations of Computer Science (4)
Enumeration of combinatorial structures. Ranking and unranking. Graph theory with applications and algorithms. Recursive algorithms. Circuit design. Inclusion-exclusion. Generating functions. Polya theory. Three lectures, one recitation. *Prerequisite: Math. 15B or CSE 21 or Math. 109 or consent of instructor.* (W,S)

186. Probability Statistics for Bioinformatics (4)
This course will cover an introduction to probability and statistics, the use of discrete and random variables, different types of distributions, data analysis and inferential statistics, likelihood estimators and scoring matrices with applications to biological problems. Introduction to probability, Binomial, Poisson, and Gaussian distributions, central limit theorem, applications to sequence and functional analysis of genomes and genetic epidemiology. *Prerequisite: Math. 20A, Math. 20B, Math. 20C (21C).*

187. Introduction to Cryptography (4)
An introduction to the basic concepts and techniques of modern cryptography. Classical cryptanalysis. Probabilistic models of plaintext. Monalphabetic and polyalphabetic substitution. The one-time system. Caesar-Vigenere-Playfair-Hill substitutions. The Enigma. Modern-day developments. The Data Encryption Standard. Public key systems. Security aspects of computer networks. Data protection. Electronic mail. Three lectures, one recitation. *Prerequisite: programming experience.* (S)

188. Design and Analysis of Algorithms (4)
Introduction to the design and analysis of efficient algorithms. Basic techniques for analyzing the time requirements of algorithms. Algorithms for sorting, searching, and pattern matching, algorithms for graphs and networks. NP-complete problems. Equivalent to CSE 101. *Prerequisites: CSE 100 or Math. 176A for Math. 188; CSE 12, CSE 21, and CSE 100 for CSE 101.*

190. Introduction to Topology (4)
Topological spaces, subspaces, products, sums and quotient spaces. Compactness, connectedness, separation axioms. Selected further topics such as fundamental group, classification of surfaces, Morse theory, topological groups. May be repeated for credit once when topics vary, with consent of instructor. Three lectures. *Prerequisite: Math. 109 or consent of instructor.* (W)

191. Topics in Topology (4)
Topics to be chosen by the instructor from the fields of differential algebraic, geometric, and general topology. Three lectures. *Prerequisite: Math. 190 or consent of instructor.* (S)

193A. Actuarial Mathematics (4)
Probabilistic Foundations of Insurance. Short-term risk models. Survival distributions and life tables. Introduction to life insurance. *Prerequisite: Math. 180A or 183, or consent of instructor.*

193B. Actuarial Mathematics (4)
Life Insurance and Annuities. Analysis of premiums and premium reserves. Introduction to multiple life functions and decrement models as time permits. *Prerequisite: Math. 193A.*

193C. Actuarial Mathematics (4)
Topics to be selected from pension plans, collective risk models, advanced topics in insurance. *Prerequisite: Math. 193B.*

194. The Mathematics of Finance (4)
Introduction to the mathematics of financial models. Basic probabilistic models and associated mathematical machinery will be discussed, with emphasis on discrete time models. Concepts covered will include conditional expectation, martingales, optimal stopping, arbitrage pricing, hedging, European and American options. *Prerequisites: Math. 20D (21D), Math. 20F, and Math. 180A or 183.*

195. Introduction to Teaching in Mathematics (4)
Students will be responsible for and teach a class section of a lower-division mathematics course. They will also attend a weekly meeting on teaching methods. (Does not count towards a minor or major.) Five lectures, one recitation. *Prerequisite: consent of instructor.* (F,W,S)

196. Student Colloquium (1-2)
A variety of topics and current research results in mathematics will be presented by guest lecturers and students under faculty direction. *Prerequisites: upper-division status or consent of instructor (for one unit) and consent of instructor (for two units).*

197. Mathematics Internship (2 or 4)
An enrichment program which provides work experience with public/private sector employers. Subject to the availablility of positions, students will work in a local company under the supervision of a faculty member and site supervisor. Units may not be applied towards major graduation requirements. *Prerequisites: completion of 90 units, 2 upper-division mathematics courses, an overall 2.5 UCSD G.P.A., consent of mathematics faculty coordinator, and submission of written contract. Department stamp required.*

199. Independent Study for Undergraduates (2 or 4)
Independent reading in advanced mathematics by individual students. Three periods. (P/NP grades only.) *Prerequisite: permission of department.* (F,W,S)

199H. Honors Thesis Research for Undergraduates (2-4)
Honors thesis research for seniors participating in the Honors Program. Research is conducted under the supervision of a mathematics faculty member. *Prerequisites: admission to the Honors Program in mathematics, department stamp.*

GRADUATE

200A-B-C. Algebra (4-4-4)
Group actions, factor groups, polynomial rings, linear algebra, rational and Jordan canonical forms, unitary and Hermitian matrices, Sylow theorems, finitely generated abelian groups, unique factorization, Galois theory, solvability by radicals, Hilbert Basis Theorem, Hilbert Nullstellensatz, Jacobson radical, semisimple Artinian rings. *Prerequisite: consent of instructor.*

201A. Basic Topics in Algebra (4)
Recommended for all students specializing in algebra. Basic topics include categorical algebra, commutative algebra, group representations, homological algebra, nonassociative algebra, ring theory. *Prerequisites: Math. 200A-B-C or consent of instructor.* (F,W,S)

202B-C. Applied Algebra (4-4)
Algebra from a computational perspective using Maple, Mathematica and Matlab. Groups, rings, linear algebra, rational and Jordan forms, unitary and Hermitian matrices, matrix decompositions, perturbation of eigenvalues, group representations, symmetric functions, fast Fourier transform, commutative algebra, Grobner basis, finite fields. *Prerequisite: consent of instructor.*

203A-B-C. Algebraic Geometry (4-4-4)
Places, Hilbert Nullstellensatz, varieties, product of varieties: correspondences, normal varieties. Divisors

and linear systems; Riemann-Roch theorem; resolution of singularities of curves. Grothendieck schemes; cohomology, Hilbert schemes; Picard schemes. *Prerequisites: Math. 200A-B-C.* (F,W,S)

204. Topics in Number Theory (4)
Topics in analytic number theory, such as zeta functions and L-functions and the distribution of prime numbers, zeros of zeta functions and Siegel's theorem, transcendence theory, modular forms, finite and infinite symmetric spaces. *Prerequisite: consent of instructor.*

205. Topics in Algebraic Number Theory (4)
Topics in algebraic number theory, such as cyclotomic and Kummer extensions, class number, units, splitting of primes in extensions, zeta functions of number fields and the Brauer-Siegel Theorem, class field theory, elliptic curves and curves of higher genus, complex multiplication. *Prerequisite: consent of instructor.*

207A-B-C. Topics in Algebra (4-4-4)
In recent years, topics have included number theory, commutative algebra, noncommutative rings, homological algebra, and Lie groups. May be repeated for credit with consent of adviser. *Prerequisite: consent of instructor.*

208. Seminar in Algebra (1-4)
Prerequisite: consent of instructor. (S/U grades permitted.)

209. Seminar in Number Theory (1 to 4)
Prerequisite: consent of instructor. (S/U grades permitted.)

210A. Mathematical Methods in Physics and Engineering (4)
Complex variables with applications. Analytic functions, Cauchy's theorem, Taylor and Laurent series, residue theorem and contour integration techniques, analytic continuation, argument principle, conformal mapping, potential theory, asymptotic expansions, method of steepest descent. *Prerequisites: Math. 20DEF, 140A/142A or consent of instructor.*

210B. Mathematical Methods in Physics and Engineering (4)
Linear algebra and functional analysis. Vector spaces, orthonormal bases, linear operators and matrices, eigenvalues and diagonalization, least squares approximation, infinite-dimensional spaces, completeness, integral equations, spectral theory, Green's functions, distributions, Fourier transform. *Prerequisite: Math. 210A or consent of instructor.* (W)

210C. Mathematical Methods in Physics and Engineering (4)
Calculus of variations: Euler-Lagrange equations, Noether's theorem. Fourier analysis of functions and distributions in several variables. Partial differential equations: Laplace, wave, and heat equations; fundamental solutions (Green's functions); well-posed problems. *Prerequisite: Math. 210B or consent of instructor.* (S)

211. Fourier Analysis on Finite Groups (4)
Applied group representations. Emphasis on the integers, mod n, finite matrix groups. Applications may include: the fast Fourier tranform, digital signal processing, finite difference equations, spectral graph theory, error-correcting codes, vibrating systems, finite wavelet tranforms. *Prerequisite: none.*

212A. Introduction to the Mathematics of Systems and Control (4)
Linear and nonlinear systems, and their input-output behavior, linear continuous time and discrete-time systems, reachability and controllability for linear systems, feedback and stabilization, eigenvalue placement, nonlinear controllability, feedback linearization, disturbance rejection, nonlinear stabilization, Lyapunov and control-Lyapunov functions, linearization principle for stability. *Prerequisites: Math. 102 or equivalent, Math. 120A or equivalent, Math. 142A or equivalent.*

212B. Introduction to the Mathematics of Systems and Control (4)
Observability notions, linearization principle for observability. Realization theory for linear systems, observers and dynamic feedback, detectability, external stability for linear systems, frequency-domain considerations, dynamic programming, quadratic cost, state estimation and Kalman filtering, nonlinear stabilizing optimal controls, calculus of variations, and the Maximum Principle. *Prerequisite: Math. 212A.*

212C. Introduction to the Mathematics of Systems and Control (4)
Topics of current interest on systems theory, control, and estimation to be chosen by instructor. *Prerequisite: Math. 212B.*

216. Topics in Pure Mathematics (4)
This course brings together graduate students, postdocs, and faculty to examine a current research topic of broad interest. Previously covered topics include: noncommutative geometry, Loop groups, geometric quantization. *Prerequisite: consent of instructor.*

217A. Topics in Applied Mathematics (4)
In recent years, topics have included applied complex analysis, special functions, and asymptotic methods. May be repeated for credit with consent of adviser. *Prerequisite: consent of instructor.*

220A-B-C. Complex Analysis (4-4-4)
Complex numbers and functions. Cauchy theorem and its applications, calculus of residues, expansions of analytic functions, analytic continuation, conformal mapping and Riemann mapping theorem, harmonic functions. Dirichlet principle, Riemann surfaces. *Prerequisites: Math. 140A-B or consent of instructor.* (F,W,S)

221A-B. Topics in Several Complex Variables (4-4)
Formal and convergent power series, Weierstrass preparation theorem; Cartan-Ruckert theorem, analytic sets; mapping theorems; domains of holomorphy; proper holomorphic mappings; complex manifolds; modifications. *Prerequisites: Math. 200A and 220A-B-C or consent of instructor.*

227A-B. Topics in Complex Analysis (4-4)
In recent years, topics have included conformal mapping, Riemann surfaces, value distribution theory, external length. May be repeated for credit with consent of adviser. *Prerequisite: consent of instructor.*

229. Computing Technology for Mathematics (2)
Preparation for making effective use of computer technology in research and teaching of mathematics. UNIX basics, document preparation using TEX, Internet resources, HTML, computer technology in teaching. *Prerequisite: graduate status in mathematics.*

231A-B-C. Partial Differential Equations (4-4-4)
Existence and uniqueness theorems. Cauchy-Kowalewski theorem, first order systems. Hamilton-Jacobi theory, initial value problems for hyperbolic and parabolic systems, boundary value problems for elliptic systems. Green's function, eigenvalue problems, perturbation theory. *Prerequisites: Math. 210A-B or 240A-B-C or consent of instructor.*

233. Singular Perturbation Theory for Differential Equations (4)
Multivariable techniques, matching techniques and averaging techniques, including various approaches to proofs of asymptotic correctness, for singular perturbation problems including initial value problems with nonuniformities at infinity, initial value problems with initial nonuniformities, two point boundary value problems, and problems for partial differential equations. Applications taken from celestial mechanics, oscillation problems, fluid dynamics, elasticity, and applied mechanics. *Prerequisites: Math. 130A-B or 132A-B or consent of instructor.* (S/U grades permitted.) (S)

237A-B-C. Topics in Differential Equations (4-4-4)
May be repeated for credit with consent of adviser. *Prerequisite: consent of instructor.*

240A-B-C. Real Analysis (4-4-4)
Lebesgue integral and Lebesgue measure, Fubini theorems, functions of bounded variations, Stieltjes integral, derivatives and indefinite integrals, the spaces L and C, equi-continuous families, continuous linear functionals general measures and integrations. *Prerequisites: Math. 140A-B-C.* (F,W,S)

241A-B. Functional Analysis (4-4)
Metric spaces and contraction mapping theorem; closed graph theorem; uniform boundedness principle; Hahn-Banach theorem; representation of continuous linear functionals; conjugate space, weak topologies; extreme points; Krein-Milman theorem; fixed-point theorems; Riesz convexity theorem; Banach algebras. *Prerequisites: Math.240A-B-C or consent of instructor.*

247A-B-C. Topics in Real Analysis (4-4)
In recent years, topics have included Fourier analysis, distribution theory, martingale theory, operator theory. May be repeated for credit with consent of adviser. *Prerequisite: consent of instructor.*

248. Seminar in Real Analysis (1 to 4)
Prerequisite: consent of instructor. (S/U grades permitted.)

250A-B-C. Differential Geometry (4-4-4)
Differential manifolds, Sard theorem, tensor bundles, Lie derivatives, DeRham theorem, connections, geodesics, Riemannian metrics, curvature tensor and sectional curvature, completeness, characteristic classes. Differential manifolds immersed in Euclidean space. *Prerequisite: consent of instructor.* (F,W,S)

251A-B-C. Lie Groups (4-4-4)
Lie groups, Lie algebras, exponential map, subgroup subalgebra correspondence, adjoint group, universal enveloping algebra. Structure theory of semi-simple Lie groups, global decompositions, Weyl group. Geometry and analysis on symmetric spaces. *Prerequisites: Math. 200 and 250 or consent of instructor.* (F,W,S)

256. Seminar in Lie Groups and Lie Algebras (2 to 4)
Various topics in Lie groups and Lie algebras, including structure theory, representation theory, and applications. *Prerequisite: consent of instructor.* (F,W,S)

257A. Topics in Differential Geometry (4)
In recent years, topics have included Morse theory and general relativity. May be repeated for credit with consent of adviser. *Prerequisite: consent of instructor.*

258. Seminar in Differential Geometry (1 to 4)
Various topics in differential geometry. *Prerequisite: consent of instructor.*

259A-B-C. Geometrical Physics (4-4-4)
Manifolds, differential forms, homology, deRham's theorem. Riemannian geometry, harmonic forms. Lie groups and algebras, connections in bundles, homotopy sequence of a bundle, Chern classes. Applications selected from Hamiltonian and continuum mechanics, electromagnetism, thermodynamics, special and general relativity, Yang-Mills fields. *Prerequisite: graduate standing in mathematics, physics, or engineering, or consent of instructor.*

260A-B. Mathematical Logic (4-4)
Propositional calculus and quantification theory. Completeness theorem, theory of equality, compactness theorem, Skolem-Lowenheim theorems. Vaught's test: Craig's lemma. Elementary number theory and recursive function theory. Undecidability of true arithmetic and of Peano's axioms. Church's thesis; set theory; Zermelo-Frankel axiomatic formulation. Cardinal and ordinal numbers. The axiom of choice and the generalized continuum hypothesis. Incompleteness and undecidability of set theory. Relative consistency proofs. *Prerequisites: Math. 100A-B-C or consent of instructor.*

261A-B. Combinatorial Algorithms (4-4)
Lexicographic order, backtracking, ranking algorithms, isomorph rejection, sorting, orderly algorithms, network flows and related topics, constructive Polya theory, inclusion-exclusion and seiving methods, Mobius inversion, generating functions, algorithmic graph theory, trees, recursion, depth firstsearch and applications, matroids. *Prerequisites: CSE 160A-B or Math. 184A-B or consent of instructor.* (F,W,S)

262A-B. Topics in Combinatorial Mathematics (4-4)
Development of a topic in combinatorial mathematics starting from basic principles. Problems of enumeration, existence, construction, and optimization with regard to finite sets. Some familiarity with computer programming desirable but not required. *Prerequisites: Math. 100A-B-C.*

263. History of Mathematics (4)
Mathematics in the nineteenth century from the original sources. Foundations of analysis and commutative algebra. For algebra the authors studied will be Lagrange, Ruffini, Gauss, Abel, Galois, Dirichlet, Kummer, Kronecker, Dedekind, Weber, M. Noether, Hilbert, Steinitz, Artin, E. Noether. For analysis they will be Cauchy, Fourier, Bolzano, Dirichlet, Riemann, Weierstrass, Heine, Cantor, Peano, Hilbert. *Prerequisites: Math. 100A-B, Math. 140A-B.*(S)

264A-B-C. Combinatorics (4-4-4)
Topics from partially ordered sets, Mobius functions, simplicial complexes and shell ability. Enumeration, formal power series and formal languages, generating functions, partitions. Lagrange inversion, exponential structures, combinatorial species. Finite operator methods, q-analogues, Polya theory, Ramsey theory. Representation theory of the symmetric group, symmetric functions and operations with Schur functions. (F,W,S)

267A-B-C. Topics in Mathematical Logic (4-4-4)
Topics chosen from recursion theory, model theory, and set theory. May be repeated with consent of adviser. *Prerequisite: consent of instructor.* (S/U grades permitted.)

268. Seminar in Logic (1 to 4)
Prerequisite: consent of instructor. (S/U grades permitted.)

269. Seminar in Combinatorics (1 to 4)
Prerequisite: consent of instructor. (S/U grades permitted.)

270A-B-C. Numerical Mathematics (4-4-4)
Error analysis of the numerical solution of linear equations and least squares problems for the full rank and rank deficient cases. Error analysis of numerical methods for eigenvalue problems and singular value problems. Error analysis of numerical quadrature and of the numerical solution of ordinary differential equations. *Prerequisites: Math. 20F and knowledge of programming.*

271A-B-C. Numerical Optimization (4-4-4)
Formulation and analysis of algorithms for constrained optimization. Optimality conditions; linear and quadratic programming; interior methods; penalty and barrier function methods; sequential quadratic programming methods. *Prerequisite: consent of instructor.* (F,W,S)

272A-B-C. Numerical Partial Differential Equations (4-4-4)
The numerical solution of elliptic, parabolic, and hyperbolic partial differential equations; discretization and solution techniques. *Prerequisite: consent of instructor.* (F,W,S)

273A-B-C. Scientific Computation (4-4-4)
Continuum mechanics models of physical and biological systems, finite element methods and approximation theory, complexity of iterative methods for linear and nonlinear equations, continuation methods, adaptive methods, parallel computing, and scientific visualization. Project-oriented; theoretical and software development projects designed around problems of current interest in science and engineering. *Prerequisite: experience with Matlab and C, some background in numerical analysis, or consent of instructor.* (F,W,S)

277A. Topics in Numerical Mathematics (4)
Topics vary from year to year. May be repeated for credit with consent of adviser. *Prerequisite: consent of instructor.*

278. Seminar in Numerical Mathematics (1 to 4)
Prerequisite: consent of instructor. (S/U grades permitted.)

280A-B-C. Probability Theory (4-4-4)
Probability measures; Borel fields; conditional probabilities, sums of independent random variables; limit theorems; zero-one laws; stochastic processes. *Prerequisites: advanced calculus and consent of instructor.* (F,W,S)

281A. Mathematical Statistics (4)
Statistical models, sufficiency, efficiency, optimal estimation, least squares and maximum likelihood, large sample theory. *Prerequisites: advanced calculus and basic probablilty theory or consent of instructor.*

281B. Mathematical Statistics (4)
Hypothesis testing and confidence intervals, one-sample and two-sample problems. Bayes theory, statistical decision theory, linear models and regression. *Prerequisites: advanced calculus and basic probablilty theory or consent of instructor.*

281C. Mathematical Statistics (4)
Nonparametrics: tests, regression, density estimation, bootstrap and jackknife. Introduction to statistical computing using S plus. *Prerequisites: advanced calculus and basic probablilty theory or consent of instructor.*

282A-B. Applied Statistics (4-4)
Sequence in applied statistics. First quarter: general theory of linear models with applications to regression analysis. Second quarter: analysis of variance and covariance and experimental design. Third quarter: further topics to be selected by instructor. Emphasis throughout is on the analysis of actual data. *Prerequisite: Math. 181B or equivalent or consent of instructor.* (S/U grades permitted.)

283. Statistical Methods in Bioinformatics (4)
This course will cover material related to the analysis of modern genomic data; sequence analysis, gene expression/functional genomics analysis, and gene mapping/applied population genetics. The course will focus on statistical modeling and inference issues and not on database mining techniques. *Prerequisites: one year of calculus, one statistics course or consent of instructor.*

285A-B. Stochastic Processes (4-4)
Elements of stochastic processes, Markov chains, hidden Markov models, Poisson point processes, renewal processes martingales, Brownian motion, Gaussian processes, Kalman filter. Other topics to be selected by instructor depending on interest of class. *Prerequisites: Math. 180A (or equivalent basic probablilty course) or consent of instructor.*

286. Stochastic Differential Equations (4)
Review of continuous martingale theory. Stochastic integration for continuous semimartingales. Existence and uniqueness theory for stochastic differential equations. Strong Markov property. Selected applications. *Prerequisite: Math. 280A-B or consent of instructor.*

287A. Time Series Analysis (4)
Discussion of finite parameter schemes in the Gaussian and non-Gaussian context. Estimation for finite parameter schemes. Stationary processes and their spectral representation. Spectral estimation. *Prerequisite: Math. 181B or equivalent or consent of instructor.*

287B. Multivariate Analysis (4)

288. Seminar in Probability and Statistics (1 to 4)
Prerequisite: consent of instructor. (S/U grades permitted.)

289A-B. Topics in Probability and Statistics (4-4)
In recent years, topics have included Markov processes, martingale theory, stochastic processes, stationary and Gaussian processes, ergodic theory. May be repeated for credit with consent of adviser.

290A-B-C. Topology (4-4-4)
Point set topology, including separation axioms, compactness, connectedness. Algebraic topology, including the fundamental group, covering spaces, homology and cohomology. Homotopy or applications to manifolds as time permits. *Prerequisites: Math. 100A-B-C and Math. 140A-B-C.* (F,W,S)

291A-B-C. Topics in Topology (4)
In recent years, topics have included generalized cohomology theory, spectral sequences, K-theory, homotophy theory. *Prerequisites: consent of instructor.*

292. Seminar in Topology (1-4)
Various topics in topology. *Prerequisites: consent of instructor.*

294. The Mathematics of Finance (4)
Introduction to the mathematics of financial models. Hedging, pricing by arbitrage. Discrete and continuous stochastic models. Martingales. Brownian motion, stochastic calculus. Black-Scholes model, adaptations to dividend paying equities, currencies and coupon-paying bonds, interest rate market, foreign exchange models.

Prerequisite: Math. 180A (or equivalent probability course) or consent of instructor.

295. Special Topics in Mathematics (1 to 4)
A variety of topics and current research results in mathematics will be presented by staff members and students under faculty direction.

296. Student Colloquium (1 to 2)
A variety of topics and current research in mathematics will be presented by guest lecturers and students under faculty direction. *Prerequisites: for one unit—upper-division status or consent of instructor (may only be taken P/NP), or graduate status (may only be taken S/U); for two units—consent of instructor, standard grading option allowed.*

297. Mathematics Graduate Research Internship (2-4)
An enrichment program which provides work experience with public/private sector employers and researchers. Under supervision of a faculty adviser, students provide mathematical consultation services. *Prerequisites: consent of instructor.*

299. Reading and Research (1 to 12)
Independent study and research for the doctoral dissertation. One to three credits will be given for independent study (reading) and one to nine for research. *Prerequisite: consent of instructor.* (S/U grades permitted.)

Teaching of Mathematics

500. Apprentice Teaching (1 to 4)
Supervised teaching as part of the mathematics instructional program on campus (or, in special cases such as the CTF program, off campus). *Prerequisite: consent of adviser.* (S/U grades only.)

Mathematics and Science Education

OFFICE: 188 Galbraith Hall
http://public.sdsu.edu/CRMSE/jdpmain.html

Professors

Mark I. Appelbaum, *Psychology*
Ted J. Case, *Biology*
Paul M. Churchland, *Philosophy*
Michael Cole, *Communication*
Guershon Harel, *Mathematics*
Barbara Jones, *Physics*
Douglas Magde, *Chemistry and Biochemistry*
Alfred B. Manaster, *Mathematics*
Hugh B. Mehan, *Sociology*
Jeffrey Rabin, *Mathematics*
Douglas W. Smith, *Biology (Emeritus)*

Senior Lecturers (SOE)

Barbara A. Sawrey, *Chemistry and Biochemistry*
Gabriele Wienhausen, *Biology*
Randall J. Souviney, *Teacher Education Program*

Assistant Professor

Rafael E. Nunez, *Cognitive Science*

Associate Professor

John Batali, *Cognitive Science*

Lecturer (SOE)

Norman A. Shenk, *Mathematics (Emeritus)*

The Joint Doctoral Program

UCSD and San Diego State University have created this innovative program for students who already have a master's degree in biology, chemistry, mathematics, or physics. In this program, students will complement their discipline knowledge with studies of how people learn mathematics and science. The UCSD Joint Doctoral Group in Mathematics and Science Education currently consists of faculty from the Division of Biology and the Departments of Chemistry and Biochemistry, Cognitive Science, Communication, Mathematics, Philosophy, Physics, Psychology, and Sociology. The SDSU Program faculty is drawn from the Departments of Biology, Mathematical Sciences, Natural Sciences, Physics, Psychology, and Teacher Education.

The program includes research, practical applications, and formal coursework. Students must commit four years to the program, and most students will complete the program in four to five years. An individualized course of study will be designed for each student, depending on the student's background and interests.

The graduates of this program will be able to contribute to the developing body of knowledge about human cognitive processes in mathematics and science. They will be expected to maintain a strong connection to educational practice through teaching and application of research results on learning to instructional situations.

Information regarding admission is found in the current edition of the *Bulletin of the Graduate Division* of San Diego State University.

Ph.D. Time Limit Policies

All time limits for this program start when a student first registers in this program. Students must be advanced to candidacy by the end of four years. Total university support to students in this program cannot exceed five years. Total registered time in this program cannot exceed six years. The normative time in this program is five years.

COURSES

MSED 295. Orientation Practicum (2-6)
This course should be taken the first year. Each practicum lasts five weeks and is designed to inform students about a faculty member's research program.

MSED 296A-B-C. Mathematics and Science Education/ Seminar (4)
Issues concerning the learning of mathematics and science, with particular emphasis on lower-division coursework, will be addressed from the perspectives of how students learn, what students learn, and how students are taught.

MSED 298. Research Project (2–12)
Students will work on an independent research project under the supervision of MSED faculty.

MSED 299. Reading and Research (1–12)
Students will do independent study and research in preparation of their doctoral dissertation under the supervision of MSED faculty.

Mechanical and Aerospace Engineering (MAE)

See Engineering, School of

Middle East Studies

OFFICE: 3024 Humanities and Social Sciences Building, Muir College
Web site: http://historyweb.ucsd.edu/MiddleEastStud.html

Faculty

Guillermo Algaze, *Professor, Anthropology*
Eli Berman, *Professor, Economics*
Suzanne Brenner, *Associate Professor, Anthropology*
Arthur Droge, *Professor, Literature*
David Noel Freedman, *Professor, History*
Richard Friedman, *Professor, Literature*

David Goodblatt, *Professor, History*
Hasan Kayali, *Associate Professor, History*
Sanford E. Lakoff, *Professor, Political Science*
Thomas Levy, *Professor, Anthropology*
Timothy McDaniel, *Professor, Sociology*
Michael E. Meeker, *Professor Emeritus, Anthropology*
Esra Özyürek, *Assistant Professor, Anthropology*
William H. Propp, *Professor, History*
Gershon Shafir, *Professor, Sociology*
Melford E. Spiro, *Professor Emeritus, Anthropology*
Winifred Woodhull, *Associate Professor, Literature*
Oumelbanine Zhiri, *Professor, Literature*

The Minor

The minor in Middle East studies is an interdisciplinary program aimed at a comparative study of the Middle East (including North Africa).

The program consists of seven courses, of which at least five must be upper-division courses. Three courses have to deal with the Middle East since the emergence of Islam, as listed here under "Core Courses." The remaining courses may be chosen from either the Core Courses or the Supporting Courses; and they may be courses dealing with the ancient, medieval, or modern Middle East or a three-quarter sequence of a Middle Eastern language (in which case only four of the seven courses need to be upper-division). Ordinarily, all seven courses must be taken for a letter grade.

The courses which make up the minor must be approved by the student's college and by the Middle East Studies Program.

Approved courses taken at other universities or through participation in the Education Abroad Program can be included as part of the minor by petition.

COURSES

CORE COURSES

ANRG 122. Peoples and Culture of the Middle East

ANPR 199. Independent Study (Middle East Anthropology)

HINE 108. The Middle East before Islam

HINE 114. History of the Islamic Middle East

HINE 116. The Middle East in the Age of European Empires

HINE 118. The Middle East in the Twentieth Century

HINE 166. Nationalism in the Middle East

HINE 186. Special Topics in Middle Eastern History

HINE 199. Independent Study (Middle East History)

HITO 105. Jews and Judaism in the Modern World

LTWL 141. Islam and Modernity

LTWL 160. Women in Literature: Arabic Women in Literature & Society

POLI. 121. Middle East Politics

POLI. 138D. Special Topics/Comparative Polities: The Arab-Israeli Conflict

Soc./D 122. Jerusalem: Sacred and Profane

Soc./D 158. Islam in the Modern World

Soc./D 188F. Modern Jewish Societies and Israeli Society

Soc./E 199. Independent Study (Middle East Sociology)

TWS 25. Third-World Literatures

SUPPORTING COURSES

ANLD 3. World Prehistory

ANRG 115. Foundations/Social Complex/Near East

ANRG 116. Archaeology of Society in Syro-Palestine

ANRG 182. Ethnography of Island Southeast Asia

JUDA 1. Beginning Hebrew

JUDA 2. Intermediate Hebrew

JUDA 3. Intermediate Hebrew Continued

JUDA 101. Introduction to Hebrew Texts

JUDA 102. Intermediate Hebrew Texts

JUDA 103. Advanced Hebrew Texts

HINE 100. The Ancient Near East and Israel

HINE 102. The Jews in Their Homeland in Antiquity

HINE 104. The Bible and the Ancient Near East

HINE 106. The Bible and the Near East: The Writings

HINE 160. Special Topics in the Bible and Ancient Near East

HINE 170. Special Topics in Jewish History

HITO 100. Ancient Religions

LIAB 1A. Beginning Arabic

LIAB 1B. Beginning Arabic

LIAB 1C. Elementary Arabic

LIAB 1D. Elementary Arabic

LIHL 116. Arabic for Arabic Speakers

LTNE 102. Bible: The Prophetic Books

LTNE 106. Bible: Topics in Biblical Narrative

Molecular Pathology

OFFICE: 1012 Basic Science Building, School of Medicine

Professors

Stephen Baird, M.D., *Pathology (Academic Senate Distinguished Teaching Award)*
Roland C. Blantz, M.D., *Medicine*
Kenneth R. Chien, M.D., *Medicine*
Lynette B. Corbeil, D.V.M., Ph.D., *Pathology*
Jack Dixon, Ph.D., *Medicine/Pharmacology*
Daniel J. Donoghue, Ph.D., *Chemistry and Biochemistry*
Marilyn G. Farquhar, M.D., *Cellular and Molecular Medicine (Chair)*
James Feramisco, Ph.D., *Medicine/Pharmacology*
Joshua Fierer, M.D., *Medicine/Pathology (In-Residence)*
Xiang-Dong Fu, Ph.D., *Cellular and Molecular Medicine*
Frances D. Gillin, Ph.D., *Pathology (In-Residence)*
Christopher Glass, M.D., Ph.D., *C.M.M. Medicine*
Paul Insel, M.D., *Pharmacology*
Martin F. Kagnoff, M.D., *Medicine*
Michael Karin, Ph.D., *Pharmacology*
Michael J. Kelner, M.D., *Pathology*
Dzung Le, Ph.D., *Pathology*
Eliezer Masliah, M.D., *Neurosciences/Pathology*
Andrew Mizisin, Ph.D., *Pathology*
Henry C. Powell, M.D., *Pathology (Acting Chair)*
C. Ann Rearden, M.D., *Pathology*
Sharon Reed., M.D., *Pathology*
Douglas Richman, M.D., *Pathology/Medicine (In-Residence)*
Michael G. Rosenfeld, Ph.D., *Medicine*
Deborah H. Spector, Ph.D., *Biological Sciences*
Ajit P. Varki, M.D., *Medicine*
Gernot Walter, Ph.D., *Pathology*
Tony Yaksh, Ph.D., *Anesthesiology/Pharmacology*

Associate Professors

Nigel Calcutt, Ph.D, *Pathology*
Richard Gallo, M.D., Ph.D., *Medicine*
John Guatelli, M.D., *Medicine*
Mark P. Kamps, Ph.D., *Pathology (Director)*
Fred Levine, M.D., Ph.D., *Pediatrics*
Victor Nizet, M.D., *Pediatrics*
Joe Vinetz, Ph.D., *Medicine*

Assistant Professors

Ju Chen, Ph.D., *Medicine*
Steffan Ho, Ph.D., *Pathology*
Paul Martin, Ph.D., *Neurosciences*
Bing Ren, Ph.D., *Cellular and Molecular Medicine*

Adjunct Professors

Kathryn Ely, Ph.D., *Pathology*
Eva Engvall, Ph.D., *Pathology*
Hudson Freeze, Ph.D., *Pathology*
Minoru Fukuda, Ph.D., *Pathology*
Martin Haas, Ph.D., *Biology*

Mike Kalichman, Ph.D., *Pathology*
Stuart Lipton, M.D., *Neurosciences*
Rich Maki, Ph.D., *Pathology*
Mark Mercola, Ph.D., *Pathology*
Robert Oshima, Ph.D., *Pathology*
Elena Pasquale, Ph.D., *Pathology*
Manuel Perucho, Ph.D., *Medicine/Pathology*
James Quigley, Ph.D., *Pathology*
John Reed, M.D., Ph.D., *Pathology*
Diane Shelton, D.V.M., *Pathology*
Ian Wilson, Ph.D., *Pathology*

Associate Adjunct Professors

Jacques Corbeil, Ph.D., *Medicine*
Sylvia Evans, Ph.D., *Medicine*
Gen-Sheng Feng, Ph.D., *Pathology*
Steven Frisch, Ph.D., *Pathology*
Roberta Gottlieb, M.D., *Pathology*
David W. Rose, Ph.D., *Medicine*
Guy Salvesen, Ph.D., *Pathology*

Associate Clinical Professor

H. Elizabeth Broome, M.D., *Pathology*

The Graduate Program

The goal of the molecular pathology Ph.D. program is to provide research training in the molecular mechanisms of human disease for students pursuing biomedical careers in academia or the biotechnology industry. The program is interdepartmental in nature. It is centered in the Department of Pathology, but faculty members are also drawn from other departments and institutions. The program provides a comprehensive knowledge of normal and abnormal biological processes, with particular emphasis on the molecular mechanisms of human diseases.

Course Work

The goal of the Molecular Pathology Program is to produce outstanding researchers focused on the molecular basis of disease who also understand disease at levels of histology, pathology, and treatment. The basic science curriculum includes classes in Molecular Biology of the Cell, Methods in Cellular and Molecular Pathology, the Molecular Pathology of Cancer, and Neurologic and Muscle Disease. Electives are offered in Microbial Pathogenesis and Mouse Models for Human Disease. Learning is focused on reading and evaluating current scientific literature, with special attention to identifying the major open questions within a field and determining the correct experimental plan to answer these questions. Two electives are required, and may also be selected from graduate level courses offered by other medical school programs or undergraduate departments (biology, chemistry and biochemistry, bioengineering). This option allows students the opportunity to acquire advanced training in areas they have selected for graduate research. Popular classes are graduate level immunology, genetics, neurobiology, molecular modeling, microbial pathogenesis, and mouse models of human disease. An education in histology and pathology is acquired by taking the School of Medicine course in histology and an overview course in human pathology developed by Department of Pathology faculty for molecular pathology and pharmacy students. All students must take five of seven core courses offered by faculty members from the Department of Pathology. Students may elect to take in-depth pathology training in their particular disease(s) of interest by attending a set of comprehensive lectures (eight to twelve) taught as part of the comprehensive medical school pathology curriculum. Concurrent with their thesis research, third-year students can acquire a practical consideration of the clinical treatment of disease by attending pathology conferences, including Breast Pathology Conference, Tumor Board, Pediatric Autopsy, and Neuropathology "Brian-cutting" conference. In such conferences, students learn how disease presents and progresses, how physicians currently treat disease, what the practical obstacles are in disease treatment, and where the opportunities are for development of molecular therapeutics.

Examinations

First Qualifying Examination (Minor Proposition)

The purpose of this examination is to test the student's ability to choose a research problem in molecular pathology and to propose an experimental approach to its solution. The problem should be unrelated to the student's thesis project. The student is expected to demonstrate knowledge in molecular biology and basic pathology. The first qualifying examination will be taken by the end of the fall quarter of the second year.

Second Qualifying Examination (Major Proposition)

The second qualifying examination, a university requirement, consists of an oral report by the student about research accomplished and the goals to be achieved for completion of the thesis. Upon successful completion of the examination, the student will advance to candidacy. The second qualifying examination should be completed by the end of the third year, and must be completed by the end of the fourth year.

Departmental Ph.D. Time Limit Policies

Students must be advanced to candidacy by the end of four years. Total university support cannot exceed six years. Total registered time at UCSD cannot exceed seven years.

COURSES

PATH 208G. Human Disease (8)
An integrated consideration of the general principles of pathology and microbiology, epidemiology, and medical therapeutics of the important diseases. An example of their application to a specific organ system will be included.

PATH 220. Molecular Pathology of Disease (4)
This course will explore the molecular pathology associated with various diseases other than cancer. Emphasis will be placed on understanding the abberant cellular processes, caused by mutation or environmental factors, that are associated with the disease state. Cardiovascular, neurological, immunological, and other diseases will be investigated.

PATH 221. Molecular Pathology of Cancer (4)
The purpose of this course is to present exciting new developments in molecular carcinogenesis, with particular emphasis on oncogene expression and functions of oncogenic proteins. The relevance of molecular mechanisms for understanding human cancer will be discussed.

PATH 222. Microbial Pathogenesis (3)
Topics covered in this course include molecular and cellular mechanisms of viral, bacterial, and protozoan pathogenesis. Host response and microbial mechanisms of host defense will also be discussed. Sessions will consist of faculty and student presentations of current literature.

PATH 225. Molecular Pathology Research Seminar (2)
Group and individual discussion of current literature and ongoing research activities. The format of SOM 225 will encourage student participation. Students are to present on their rotation work or current research project.

PATH 230G. Molecular Biology of the Cell (6)
An integrated consideration of the general principles of molecular pathology. This course will provide the basic foundation of the molecular biology of the cell for graduate students as a prerequisite for Pathology 208G. This course is for graduate students only.

PATH 231. Modern Methods in Cellular and Molecular Pathology (4)
This course presents key concepts and methodologies used in cellular and molecular pathology research. Topics will include cell membrane transport, protein purification, recombinant DNA techniques, DNA sequencing, and PCR technology. The relevance of these methods for investigating human disease will be discussed.

PATH 232. Statistical Methods and Experimental Design
This course will emphasize the relationships between experimental design, statistical methods, and biomedical research. The content of the course will include basic issues in experimental design and commonly used statistical methods. The assumptions behind the statistical tests, their appropriate use, and examples of misuse will be discussed.

PATH 296. Directed Reading (1-4)
Reading and laboratory study of special topics under the direction of a faculty member. Exact subject matter to be arranged in individual cases.

PATH 299. Independent Study or Research (1-12)
Independent study or research.

SOM 213. Histology (2)
This course teaches the structural basis of normal and abnormal function at the cellular and tissue levels. Emphasis is based on microscopic study conducted in small laboratory groups under close faculty supervision.

Muir College

OFFICE: Provost, Muir College, 2126 Humanities and Social Sciences Building

COURSES

199. Muir Special Project (4-16)
A course of independent work on a research or creative project to satisfy a Muir graduation requirement. (Only Muir students who have had Muir Special Project proposals approved may enroll in this course.) Students wishing to enroll must submit a written request with a description of the project. (Muir students must submit the Muir Special Project 199 form to the major adviser and to the Office of the Provost by the seventh week of the quarter prior to the quarter in which the 199 is to be undertaken. For information on other requirements, consult the provost's office.) *Prerequisites: upper-division status, approval by project adviser and by provost.* (Letter grades only.)

The Writing Program

OFFICE: 2346 Humanities and Social Sciences Building, Muir College (858) 534-2522.

DIRECTOR: Barbara Tomlinson, Ph.D., *Professor of Literature*

The Muir College Writing Program is a sequence of courses in critical thinking and the writing of expository prose during which students must advance beyond the basic competency expected at entrance to understand and write discourse acceptable at the university level. Even when faced with challenging topics, students must demonstrate the ability to comprehend texts at more than a superficial level; their writing must exhibit focused theses, systematic methods of analysis and argumentation, awareness of the needs of their audience, strong organization and development, clear presentation of ideas, appropriate syntax and diction, and—needless to say—correct grammar and usage.

To achieve these ends, the courses focus on principles of analysis and reasoned argumentation. Through close reading of texts, students learn both to identify underlying issues, assumptions, and values, and to identify rhetorical strategies by which these are conveyed or revealed. Students also learn to monitor and adapt their own writing processes. Since the ability to evaluate one's own writing and carry out appropriate revision strategies is particularly crucial to effective writing, all students are required to revise their papers several times. Attention is devoted to developing skill in evaluation and revision in discussion sections and in individual conferences with instructors. Sections of MCWP 50 vary in theme and content, giving students the opportunity to write in areas that interest them or that may be relevant to their major fields. (Descriptions of the MCWP 50 sections are available each quarter in the Muir Writing Program office during preregistration.)

Students are required to take both MCWP 40 and MCWP 50 for a letter grade in their first year of residence at the college. All transfer students, upon satisfaction of Subject A, must take MCWP 40 and MCWP 50 in their first year of residence. In cases where more than one quarter of practice is needed to prepare a student for MCWP 50, an IP grade is given in MCWP 40, and the student takes MCWP 41. MCWP 41 is then followed by MCWP 50. Completion of the sequence allows students to meet the Muir College writing requirement.

Certain exceptionally well-prepared students, particularly transfer students, may satisfy the MCWP 40 or MCWP 50 requirement by examination. The Muir challenge examinations are given at the beginning of fall and winter quarters only. Students may not take the challenge in the same quarter in which they expect to graduate.

IGETC and TAG certified transfer students: please contact the Muir Writing Program Office.

40. Critical Writing (4)
First course of sequence in university reading and writing which satisfies the Muir College graduation requirement in writing. Required of all Muir College first-year students and of transfer students who have not completed a comparable course elsewhere. MCWP 40 introduces students to the basic elements of argument and analysis. Students engage in close reading of texts, weekly writing and revision, and individual conferences. Course must be taken for a letter grade. Those who need additional work to prepare for MCWP 50 will be given a grade of IP and will be required to take MCWP 41. *Prerequisite: satisfaction of the Subject A requirement.*

41. Special Study in Writing (4)
An individualized writing class including both class discussion and tutorials. Students confer individually with instructors on a regular weekly basis to talk about writing problems. The course is designed for students who have taken MCWP 40 or its equivalent but need additional writing practice to prepare for MCWP 50. MCWP 41 does not satisfy the first part of the Muir Writing requirement. MCWP 41 must be taken for a letter grade and must be taken within two quarters of MCWP 40. *Prerequisite: MCWP 40 or its equivalent.*

50. Critical Writing (4)
Second course of sequence in reading and writing which satisfies the Muir College graduation requirement in writing. Required of all Muir College first-year students and of transfer students. MCWP 50 focuses on advanced skills of argument and analysis. Students engage in close reading of texts, weekly writing and revision, and individual conferences. Course must be taken for a letter grade. *Prerequisite: satisfaction of MCWP 40 requirement or completion of TAG or IGETC agreement.*

Music

OFFICE: 111 Mandeville Center for the Arts
Web page: http://www.ucsd.edu/music

Professors

Charles R. Curtis, M.M.
Chaya Czernowin, Ph.D.
Anthony C. Davis, B.A.
John W. Fonville, D.M.A., *Chair*
Edwin L. Harkins, Ph.D.
Aleck Karis, M.M.
Philip C. Larson, M.M.
Cecil W. Lytle, B.A., *Provost, Thurgood Marshall College*
F. Richard Moore, Ph.D.
János Négyesy, Dip. Mus.
Jann C. Pasler, Ph.D.
Carol Plantamura, M.F.A.

Miller S. Puckette, Ph.D.
Roger L. Reynolds, M.M.
Steven E. Schick, M.M.
Harvey Sollberger, M.A.
Rand Steiger, M.F.A.
Chinary Ung, Ph.D.

Professors Emeritus

Peter Farrell, M.M.
Thomas B. Nee, M.A.
Wilbur L. Ogdon, Ph.D.
John J. Silber, Ph.D.
Bertram J. Turetzky, M.A.
Joji Yuasa

Associate Professors

Gerald J. Balzano, Ph.D.
Jane R. Stevens, Ph.D.

Assistant Professors

David Borgo, Ph.D.
Shlomo Dubnov, Ph.D.
Andy Fry, D.Phil.
Nancy Guy, Ph.D.

Senior Lecturer with Security of Employement

James R. Cheatham, Dip. Mus., *Emeritus*

UCSD Regents' Professor

Ravi Shankar

Lecturers

Kenneth Anderson
Susan Barrett, M.A.
Edgar Billups, M.M.
David Chase, D.M.A.
Craig Dawson
Warren Gref
Kamau Kenyatta, B.A.
Päivikki Nykter, Dip. Mus.
Robert Ramsey, B.A.
Sylvia Ré, B.A.
Anne Seshadri, Ph.D.
Kartik Seshadri, M.B.A.
Steven Takasugi, Ph.D.
Stefani Walens, M.M.
Robert Zelickman, M.F.A.

Music Technology Director

Peter Otto, M.F.A., *Lecturer*

This department is dedicated to the development of musical intelligence and capacity, centering its quest on the music of our own time. The undergraduate programs intend to enhance the exercise and comprehension of the music-making process. The graduate programs aim to educate practitioners and researchers who can nourish the entire domain of music as well as extend its boundaries.

Resources

Performance/Production Opportunities

Although performance students take lessons and give recitals within the framework of their degree program, non-performance students are also encouraged to participate in the performance life of the department—in ensembles, festivals, and collaborative ventures.

During the academic year, a diverse slate of more than 150 public concerts is presented in well-equipped venues: Mandeville Center Auditorium (792 seats), Mandeville Recital Hall (150 seats), Erickson Hall (150 seats), and Studio A (100 seats). These concerts provide students with both performance experience and a forum for examining the music of diverse eras and cultures. Substantial resources and staffing are dedicated to producing the music of our time, including faculty and student works, by new music ensembles, SONOR (faculty), experimental and improvisation ensembles, and student performance collectives (New Music Forum, Performers' Forum, and CS/EP Forum).

Practice facilities include a complement of grand pianos, disclaviers and uprights, an electronic keyboard lab, several harpsichords, a wide array of percussion, a percussion studio, and a limited collection of musical instruments for student checkout.

ENSEMBLES IN RESIDENCE

Concert Choir
Chamber Music Ensembles
Chamber Orchestra
Chamber Singers
Ensemble Realization of Unconventionally Notated Scores
Gospel Choir
Improvisation Ensemble
Jazz Chamber Ensembles
Large Jazz Ensemble
La Jolla Symphony and Chorus
redfishbluefish
SONOR
Wind Ensemble
World Music (Sitar & Tabla)

VISITING ARTISTS/ARTISTS IN RESIDENCE

Visiting artists and artists in residence play an integral part in the research at UCSD's Department of Music. Outside artists collaborate with faculty and students in Focus seminars, concerts, week-long festivals, and colloquia, bringing an array of new creativity and ideas.

Music Technology Facilities

http://orpheus.ucsd.edu/dept.music/musictech

The Department of Music maintains highly sophisticated, continuously upgraded facilities for the support of graduate and undergraduate instruction.

Computer Music Instructional Laboratory (B-104)— Mandeville Center room B-104 was originally established in 1987 to support undergraduate and graduate studies in computer music. B-104 is a 900-square-foot facility with recessed storage and printing areas, machine isolation, acoustical treatments, presentation console, ergonomic workstation components, high-resolution data projection system, CD and DVD authoring, and integrated digital and analog audio equipment for student access to audio processing, duplicating, mixing and high-quality multi-channel audio monitoring.

A server is maintained with network connections, mass storage, and archiving systems. Intel computer workstations run unique music software packages developed at UCSD. The CARL package, by Professor F.R. Moore and Gareth Loy, earned UCSD an international reputation for computer music and was adopted for use in computer music facilities around the world. Pd is a new real-time, interactive musical and graphics programming environment written and under continuing development by Professor Miller Puckette. Other audio and graphics editing and processing software packages are also supported. Mobile systems optimized for live performance applications are also maintained in B-104. The facility is configured and optimized to support direct connection of musical instruments to computers for prototyping of real-time interactive performance and compositional projects using MAX/MSP/Jitter and Pd computer music software.

Digital Music Project Studio (B-108)— Mandeville Center room B-108 Digital Music

Project Studio is a 900-square-foot facility, including an isolation booth, absorption and diffusion treatments, data connections and audio tie-lines to B-104 and Erickson Hall. This studio houses Macintosh and Linux systems and many dedicated devices for music production and recording, including a ProTools digital audio production package with 8 channels of digital and analog i/o for precise digital recording and editing. Recent upgrades include improved microphone preamps and an array of new software packages including ProTools plugins and spatialization tools. The studio features a Tascam 24-track hard disk and digital multi-track recorders with synchronization and digital i/o, a Yamaha 02R96 digital mixing console with all upgrades, Zsys digital patchers, and sound-for-picture capabilities. The studio supports MIDI for synthesis, processing, and control in music composition and performance, and includes hardware and software for CD and DVD mastering.

Open Computing Laboratory (B-206)—This facility occupies 1950 square feet, with audio and printer connections to B-104. All workstations are networked and several stations are equipped with CD and DVD burning equipment. B-206 was established in 1990 to support many facets of the music department curriculum, and has been upgraded incrementally nearly every year thereafter. It now comprises of 17 computer workstations (13 iMacs, 3 desktop G4s, and an Intel), most with MIDI interfaces and Yamaha SY22/33 synthesizer. Coda Finale, Max/MSP, Soundhack, Metasynth, Pd, and IRCAM Forum are some of the packages supported in the lab. Large-format music and text printing are supported. For instructional presentation, the room features a high quality data projection and sound system. The presentation station also features a PC workstation, a G4 Mac with stereo ProTools editing, DAT, Bias Peak editor and SpectraFoo, signal display software, and a CD burner.

Media Networking—B-104, B-108, B-206, and most of UCSD Department of Music's performance spaces and classroom spaces have been upgraded for fast ethernet and media networking. Media networking allows advanced students and researchers to "stream" digital video and audio among diverse on-campus facilities and onto the Internet. Additionally, there is wireless connectivity at various campus locations.
http://www-crca.ucsd.edu

CONCERT AND RECORDING TECHNOLOGY

http://www.ucsd.edu/music/cd

Students can check out recording and concert production equipment on a daily basis. All faculty and most student concerts are recorded by professional staff or their assistants, and qualified students can utilize the department's extensive high tech resources for experimental projects resulting in public performance and recordings of new works. Our first annual 2-CD compilation, guided by faculty mentors, features advanced graduate students who performed, composed, edited, and collaborated to produce a snapshot of musical achievement that predicts distinguished careers and new avenues of musical thought and practice.

WARREN STUDIOS

http://orpheus.ucsd.edu/dept.music/musictech

The Warren Studios are state-of-the-art musical recording and faculty research facilities. The studios were designed to serve the faculty and advanced students of the music department, meeting the following objectives:

- to serve as an unsurpassed facility for recording and mastering of musical works
- to serve as a reference-critical listening space for the evaluation of audio production and musical materials
- to support faculty research in psychoacoustics, computer music, audio signal processing, and musical performance. These fully professional studios support most formats of analog and digital audio, all phases of tracking, mixing, and CD mastering, and feature sufficient infrastructure to enable large video and film shoots with full synchronization.

Center for Research in Computing and the Arts (CRCA)

http://www-crca.ucsd.edu

The Center for Research in Computing and the Arts (CRCA) is an organized research unit of UCSD. CRCA exists to foster collaborative working relationships among artists, scientists, and technologists by identifying and promoting projects in which common research interests may be advanced through the application of computer-mediated strategies.

Computer music projects at CRCA cover a broad spectrum, from pure research to technically advanced creative endeavors. Current research in spatialized audio, computer music languages, interactive performance, and synthesis techniques is conducted at CRCA.

CRCA offers a broad array of events in its facility, reflecting the areas of research and artistic expression of our faculty, students, associates, and visiting scholars. The center's event space offers 8-channel spatialized sound capabilities, seating for 75 to 100, projection of computer and video sources, and audio playback from digital and analog sources.

Music Library

http://orpheus.ucsd.edu/music

The Music Library (located in Geisel Library) houses an extensive collection of holdings in all areas of Western music, and possesses one of the most exhaustive collections of twentieth-century music in this country. In addition, the collection of materials in non-Western music is aggressively being expanded. The Music Library has remote playback capability whose purpose is to support the coursework and research of UCSD faculty and students. The listener can directly control any of the cassette decks, reel-to-reel tape decks, turntables, CD players, laser disc players, VHS HiFi VCRs, and BETA HiFi VCRs. Ten of the remote control listening stations are equipped with video monitors. The Auxiliary Studio and Seminar Room are equipped with full remote control of any of the audio or video equipment. The Music Library's innovative Digital/Audio Reserve Project (DARP) uses networked audio streaming to maximize student access to listening assignments.

The Undergraduate Program

Undergraduate courses offered in the Department of Music satisfy a wide range of interests for non-music majors as well as for students majoring in music.

Students wishing to acquire a musical background to support further study should take Music 1A-B-C, which develops skills musicians use in the analysis and performance of music. Students interested in "music appreciation" should choose from the following courses, which introduce aspects of the rich heritage of music: Music 4–15. None of the aforementioned courses have prerequisites. For students with prior musical background who wish to continue in upper-division theory courses, Music 2A-B-C (*in lieu* of 1A-B-C) is essential.

Music Major Programs

The undergraduate program at UCSD offers a bachelor of arts degree in *music* and in *music humanities*. The curriculum emphasizes the development of musical listening and performance skills as applied to both contemporary and traditional music.

The *music major* is intended for students who may choose to engage in music as a profession. This major thus requires extensive development of musical skills. A student without the appropriate level of those skills upon entrance to UCSD must devote considerable time to attaining them, either in lower-division courses or independent study. Students can concentrate in composition, performance, literature, technology, or jazz and the music of the African diaspora.

The Department of Music is committed to creative music making; thus all music majors are required to enroll in ensemble performance for at least three quarters (see #8 below).

The *music/humanities major* is intended for students who wish to pursue a broad liberal arts program that includes music as a central element. This program emphasizes music history and literature, and allows the individual student to select an area of interest for the major within the broad field of the humanities.

Music Major Requirements

The lower-division prerequisites for the music major are Music 2A-B-C, and Music 2AK-BK-CK. Jazz emphasis students take Music 2JK in lieu of 2CK. To continue within the major, all students must pass Music 2C or an equivalent proficiency exam. Composition emphasis students must take Music 33, Introduction to Composition, or take a proficiency exam for the course. All required music major courses must be taken for a letter grade, with the exception of Music 143, which is taken on a Pass/No Pass basis. All courses to be counted toward satisfying the major requirements must be passed with a grade of C or better.

To complete the music major the following courses are required. Courses which are specific to each area of emphasis are shown in parentheses.

1. One of the following sequences:
   - Music 101A-B-C (performance, composition, literature, and technology)
   - Music 101A-B and 104 (jazz)
2. One of the following sequences:
   - Music 102A-B-C (performance, composition, literature, and technology)
   - Music 137A-B-C (jazz)
3. Music 120A-B-C
4. One quarter of Music 133 (normally taken in the winter quarter of the junior or senior year)
5. One of the following:
   - Music 111 or 114 (performance, composition, literature, and technology)
   - Music 150 (jazz)
6. One of the following :
   - three quarters of Music 132 or 132V (performance)
   - Music 103A-B-C (composition)
   - three courses [*in addition* to Music 111 or 114] from the series Music 111-115, 126, and 127A-B (literature)
   - Music 170/171/175 (technology)
   - two courses from Music 105, 126, 127A, and 127B; *plus* one course from Music 107, 110, 111, 114, 115, or 150 [*in addition* to #5 above] (jazz).
7. One additional course to be selected from:
   - Music 111-115, 126, 127A-B, and 150 (performance, composition, literature, and technology)
   - Music 151-154 (jazz)
8. One of the following sequences:
   - three quarters of Music 95, 130, 131, or 134, *including* two quarters from 95C, 95D, or 95K (performance, composition, literature, and technology)
   - two quarters of Music 95JC or 131, *plus* one quarter of Music 95C, 95D, 95G, or 95K (jazz)
9. Music 143 every quarter

Music/Humanities Major Requirements

The prerequisite for the music/humanities major is Music 1A-B-C (or 2A-B-C, if qualified). To complete the major the following courses are required:

1. Music 120A-B-C.
2. Three courses chosen from Music 111–115, 126, and 127A-B.
3. Six upper-division courses, selected from the humanities or the fine arts, that form a coherent program of study relevant to the chosen upper-division music courses.
4. Three quarters of Music 95, 130, 131, or 134 (two from 95C, 95D, or 95K).
5. Music 143 every quarter.

Students interested in this major should confer with the music/humanities faculty adviser to work out a course of study, which must be submitted at the beginning of the junior year for the adviser's written approval.

Interdisciplinary Computing and the Arts (ICAM) Major

Major Requirements

Twenty courses are required in the computing and the arts major for the attainment of the Bachelor of Arts degree. A minimum of twelve of these courses must be upper division.

All courses taken to satisfy major requirements must be taken for a letter grade, and only grades of C– or better will be accepted in the major.

The Undergraduate Program

The Interdisciplinary Computing and the Arts program in the Music and Visual Arts departments draws upon, and aims to bring together, ideas and paradigms from computer science, art, and cultural theory. It also takes for granted that the computer has become a metamedium and that artists working with computers are expected to combine different media forms in their works. All of this makes the program unique among other currently existing computer art or design programs which, on the one hand, usually focus on the use of computers for a particular media (for instance, specializing in computer animation, or computer music, or computer design for print) and, on the other hand, does not enter into a serious dialog with the current research in computer science, only teaching the students off-the-shelf software.

The program also recognizes that creating sophisticated artistic works with computers requires a new model of the creative process, one that combines traditional artistic procedures with the experimental research characteristic of the sciences. All in all, it aims to train a new type of cultural producer, who is familiar with music technology, who is equally proficient with computer programming and artistic skills, who is

always ready to learn new technologies, and who is comfortable interacting with scientists and computer industry resources.

The goals of the program are:

- to prepare the next generation of artists who will be functioning in a computer-mediated culture
- to give students necessary technical, theoretical, and historical backgrounds so they can contribute to the development of new aesthetics for computer media
- to prepare students to mediate between the worlds of computer science and technology, the arts, and the culture at large by being equally proficient with computing and cultural concepts
- to give students sufficient understanding of the trajectories of development in computing so they can anticipate and work with the emerging trends, rather than being locked in particular software currently available on the market.

Admission to the ICAM Major

Student interest in the Interdisciplinary Computing and the Arts Major (ICAM) has been strong. Because the department has limited resources to accommodate student demand, it is necessary to limit admission to these majors to the most highly qualified students. Any student admitted to UCSD beginning in fall 2002 who wishes to declare an ICAM major will be admitted to the pre-major rather than being directly admitted to the major.

ICAM Pre-Major

Students designated as pre-majors in ICAM must complete the following eight required lower-division courses within six quarters (by the end of their sophomore years):

MUS 4, Introduction to Western Music
VIS 1, Introduction to Art-Making
ICAM 40/VIS 40, Introduction to Computing in the Arts
MATH 20A, Calculus for Science and Engineering*
MATH 20B, Calculus for Science and Engineering*
CSE 11, Introduction to Computer Science: JAVA*

and one from

MUS 1A, Musical Literacy
MUS 2A, Basic Musicianship
MUS 5, Introduction to Music Making

and one from

MUS 6, Electronic Music
MUS 7, Music, Science, and Computers
MUS 14, Contemporary Music

* MATH 20A and MATH 20B is an accelerated calculus course for science and engineering. MATH 10A-B-C covers similar material in a non-accelerated format, and can be substituted. CSE 11 is an accelerated course in the JAVA programming language. CSE 8A and CSE 8B, which cover the same material in a non-accelerated format, may be substituted.

Applying to the Major

Upon completion of all required lower-division courses, pre-majors who seek entrance to the ICAM major must formally apply at the Music Department Undergraduate Program Office. Admission will be based on the following criteria:

1. Performance in the lower-division courses as measured by a GPA of 3.0 or higher, determined by the department on an annual basis.
2. Submission to the department of a portfolio of work demonstrating superior progress as a pre-major. The portfolio will consist of at least two projects that the student has produced in ICAM 40/VIS 40, in another digital arts class, or independently, that in the faculty's judgment demonstrate that the student possesses the artistic ability and technical skills to perform at a high level in upper-division courses in the majors. Pre-majors should consult the undergraduate adviser in music as to the form in which projects should be submitted (disk, slides, tapes, etc.). For ICAM-music students the portfolio may consist of CDs, DVDs, videotapes, audio tapes, Web sites, performances and performace reviews, ICAM 40 projects, media works created independently or collaboratively with other students, media works created independently or during internships or employment, written personal statements regarding career goals; written recommendations from ICAM faculty, software design, and implementation projects.

Transfer Students

Beginning in fall 2002, transfer students who wish to declare an ICAM major are subject to the major's admissions policies: that is, they will be admitted initially as pre-majors, apply to the major on the same basis as other students, and be subject to the same requirements with respect to lower-division courses, grade-point average, and portfolio evaluation. Transfers entering with 36 or more quarter units must apply for admission to the major no later than their third quarter of study at UCSD. At the time of admission to the pre-major, transfer students' transcripts will be evaluated by the departments to determine what courses completed elsewhere, if any, may be petitioned as equivalent to required courses. Students should be prepared to provide course descriptions and other materials that may be required to determine the content of such courses.

Continuing Students (Students admitted prior to fall 2002)

Any student admitted to UCSD before fall 2002 may declare an ICAM major by completing a Change of Major form at the undergraduate adviser's office and attending an orientation meeting.

Policies Relating to the ICAM Major

Satisfactory Progress

Any ICAM major whose GPA in courses required for the major drops below 2.0 will be placed on probationary status the following quarter. If, during that probationary quarter, the GPA does not move back to up 2.0 or better, he or she will be dropped from the major.

Prerequisites

Students are required to complete all prerequisites prior to enrolling in any course required for the major. Exceptions must be negotiated with the instructor of the course in question, in consultation with the department undergraduate adviser.

Limitations to Enrollment by Non-Majors

A department stamp is required for all upper-division courses in computing in the arts. Because ICAM is an impacted major, first preference in enrollment in upper-division computing in the arts will be given to ICAM majors and to music majors with a technology concentration. Second preference will be given to other visual arts and music majors. Other students will be admitted to these courses only if space is available.

Lower-Division

(Eight courses required.)

MUS 4, Introduction to Western Music

VIS 1, Introduction to Art-Making
ICAM 40/VIS 40, Introduction to Computing in the Arts
MATH 20A, Calculus for Science and Engineering*
MATH 20B, Calculus for Science and Engineering*
CSE 11, Introduction to Computer Science: JAVA*

and one from

MUS 1A, Musical Literacy
MUS 2A, Basic Musicianship
MUS 5, Introduction to Music Making

and one from

MUS 6, Electronic Music
MUS 7, Music, Science, and Computers
MUS 14, Contemporary Music

* MATH 20A and MATH 20B is an accelerated calculus course for science and engineering. MATH 10A-B-C covers similar material in a non-accelerated format, and can be substituted. CSE 11 is an accelerated course in the JAVA programming language. CSE 8A and CSE 8B, which cover the same material in a non-accelerated format, may be substituted.

Upper-Division
(twelve courses required)

Survey (one course required)

ICAM 110. Computing in the Arts: Current Practice

Foundation (three courses required)

ICAM 101/VIS 140. Digital Imaging: Image and Interactivity
ICAM 102/VIS 145A. Digital Media I: Time, Movement, Sound
ICAM 103/MUS 170. Musical Acoustics

Advanced (four courses required)

One of:

MUS 172. Computer Music II
VIS 141B. Computer Programming for the Arts II
VIS 145B. Digital Media II
VIS 147B. Electronic Technologies for Art II

Three of:

ICAM 120. Virtual Environments
ICAM 130/VIS 149. Seminar in Contemporary Computer Topics
MUS 171. Computer Music I
MUS 173. Audio Production: Mixing and Editing
MUS 174A-B. Audio and MIDI Studio Techniques
MUS 175. Musical Psychoacoustics
MUS 176. Music Technology Seminar
VIS 109. Advanced Projects in Media
VIS 131. Special Projects in Media
VIS 132. Installation Production and Studio
VIS 141A. Computer Programming for the Arts I
VIS 147A. Electronic Technologies for Art I
VIS 174. Media Sketchbook

Theory and History (two courses required)

ICAM 150/VIS 159. History of Art and Technology

and one of:

MUS 111. World Music Traditions
MUS 114. Music of the Twentieth Century
VIS 123CN. Early Print Culture: The First Media Revolution
VIS 125E. History of Performance
VIS 150. History and Art of the Silent Cinema
VIS 151. History of the Experimental Film
VIS 152. Film in Social Context
VIS 153. The Genre Series
VIS 154. Hard Look at the Movies
VIS 155. The Director Series
VIS 157. Video History and Criticism
VIS 158. Histories of Photography

Senior Project (two courses required)

ICAM 160A. Senior Project in Computer Arts I
ICAM 160B. Senior Projects in Computer Arts II

All Computing and the Arts (ICAM) course descriptions are listed at the end of the lower- and upper-division sections under "Courses." Not all courses are offered each year.

Honors

1. To be admitted into the honors program a student must have the following:
   - Excellence in a specific subject matter (performance, composition, literature, technology, or music/humanities) and faculty support.
   - Performers must have previously performed on Performers Forum and enrolled in Chamber Music, Music 130. (Vocalists can seek an exception.) Other students must have completed all Music 95 requirements prior to entering the honors program.
   - A GPA in the Department of Music of 3.6; an overall GPA of 3.0

   All of the requirements below must be completed before the last day of instruction in the spring quarter prior to the academic year in which the student proposes to pursue an honors curriculum.
   - Performance students must present a piece before the performance faculty that demonstrates their technical and musical abilities. In addition, students must provide a proposed program for an honors recital.
   - Composition students must have a composition performed on the New Music Forum series. Either the student's principal instructor must attend this performance or a tape of this performance must be provided for faculty review. In addition, students must provide a proposed portfolio of original scores for an honors recital.
   - Literature students who have (1) presented historically- or musicologically-oriented research papers at campus venues featuring undergraduate research, or (2) been involved in the faculty mentor program, or (3) participated in the presentation of the winter opera with the accompanying symposium, may submit a portfolio of papers to the Critical Studies/Experimental Practices (CSEP) faculty. In addition, students must propose a fifty minute lecture for the Department Seminar (Music 143).
   - Music science and technology students must present a portfolio of projects to the music technology faculty and propose a fifty-minute lecture/demonstration for the Department Seminar (Music 143).
2. Once admitted to the honors program:
   - Students must be supervised by a faculty adviser throughout the honors program.
   - *Composition* students admitted to the honors program will enroll in twelve units of the Composition Honors course (Music 103D-E-F). *Performance* students will enroll in twelve units of Music 132R (after at least three quarters of Music 132). *Technology* students will enroll in twelve units of Music 176 or 199; *Music literature* and *music humanities* students will enroll in twelve units of Music 199, 150, or 107.
3. To receive honors:
   - A student must publicly demonstrate an appropriate level of excellence, an acceptable GPA, and suitable participation in department presentations and seminars,

as determined by the student's honors committee.

Please Note: Being admitted to the honors curriculum does not guarantee that a student will receive honors.

For further information on the Department of Music Honors Program and to obtain an application form, students should make an appointment with the undergraduate staff adviser.

Transfer Students

Students who plan to transfer into the music major should have strong skills in basic musicianship. For those planning to emphasize performance, solid proficiency on the instrument is required. A general course in the history of music is recommended. All transfer students must pass a proficiency examination in Music 2C (Basic Musicianship) and Music 2CK (Basic Keyboard). To verify the acceptability of transfer music courses, students must make an appointment with the undergraduate staff adviser.

Minor Programs

Please obtain a Department of Music brochure of approved minors from the undergraduate office. Students must seek advice and obtain approval from the undergraduate adviser prior to embarking upon a minor program.

The music minor for students entering UCSD in and after winter quarter 1998 consists of:

- two lower-division music courses except performance ensembles (Music 95A–Music 95W) and lessons (Music 32)
- five upper-division music courses

Students who entered UCSD before winter 1998 may select either the new minor or one of the music minors offered at the time of their entry into the university.

A minor with an emphasis in ICAM consists of seven specific courses, of which at least five must be upper division. Prospective minors should consult with the respective departmental adviser for a complete list of appropriate classes acceptable for the minor.

Advising Office

Undergraduate Staff Adviser
Eileen Voreades, Room 110
Mandeville Center, (858) 534-8226
evoreades@ucsd.edu

The Graduate Program

UCSD offers the master of arts and doctor of philosophy in music as well as a doctor of musical arts. Areas of emphasis for the M.A. include *Composition, Computer Music, Critical Studies/ Experimental Practices (CS/EP),* and *Performance.* For the Ph.D., areas of emphasis offered are *Composition, Computer Music,* and *Critical Studies/ Experimental Practices.* The doctoral of musical arts has an emphasis in *Contemporary Music Performance.*

Composition

The Composition Program is committed to nourishing the individual gifts and capacities of student composers in a diverse and active environment, with an emphasis on intensive personal interaction between faculty and student. The faculty mentor considers a student's particular goals and then attempts to strengthen his or her technical capacity to meet them. Of course, it is also the case that the diversity and liveliness of our program itself often challenges students to reevaluate their goals.

An incoming member in the M.A. or Ph.D. program begins with a year-long seminar (taught by a different faculty composer each quarter) and continues with individual studies thereafter. At the close of the first year fall quarter and again after the following spring quarter, the entire composition community gathers for a day-long "jury." Each seminar member is allotted a block of time during which the composition that has just been completed is performed and recorded in a carefully rehearsed presentation. There is a detailed discussion of each work by the faculty composers, and the student has opportunity to comment, explain, and pose questions. Following the performance and discussions of this day, the composition faculty meets to assess the students' work collectively and to offer any guidance deemed necessary. This process is at the root of the uniqueness of the UCSD program, and manifests the range, seriousness, and vitality with which compositional issues are explored here.

After completing three quarters of seminar and two juries, students come to know something about the ideas and perspectives of each faculty composer; the faculty, in turn, is aware of each student's objectives and needs. At this point, an individual mentor is agreed upon and this relationship becomes the center of the student's continuing work as the degree is completed. A Third Year Forum presents, under departmental auspices, a work composed by each third-year Ph.D. composer in the four quarters since his or her second jury. As a part of preparation for this forum, each student composer is expected to have a faculty performer on his or her Ph.D. committee (as a regular member, or as an additional sixth member). The faculty performer is the student's performance mentor and guide in interfacing with the performance community. There is also a biweekly Focus on Composition Seminar at which faculty, students and selected visitors present work of interest (compositional, analytical, technological, and even whimsical).

The seminars serve to foster mutual awareness within the student composer group. Collegial relationships develop which lead not only to friendships but also to further creative outlets in cooperative projects, including the student-run Composers' Forums, performance collectives, and recital projects. UCSD performers—faculty and student—are all committed to the playing of new music, and frequent composer/performer collaborations are a vital aspect of life in the Department of Music.

Computer Music

http://orpheus.ucsd.edu/dept.music/musictech/

The Computer Music Program emphasizes research in new techniques for electronic music composition and performance, catalyzed through an active concert program of new works by students, faculty, and visitors. Areas of research include:

- new audio synthesis techniques
- audio signal processing
- psychoacoustics
- live improvisation with and by computers
- integrating audio and video
- electronic spatialization of sounds
- techniques for live electronic music performance
- computer music software and HCL design
- audio analysis and feature detection

The Computer Music Program encourages work which overlaps with the other programs of study: composition, performance, and critical studies/experimental practices. Analyzing and performing electronic music repertoire as well

as writing new music involving electronics are encouraged.

The computer music area's first year is centered on a year-long "backbone" course covering the essentials of the computer music field. This material divides naturally into three portions (audio signal processing, compositional algorithms, and musical cognition).

In their second year, students work individually with faculty members to deepen their mastery of their subject areas of concentration. For example, a student wishing to focus on signal processing aspects might study techniques for digital audio analysis and resynthesis, drawing on the current research literature.

Also during these first two years Ph.D. students take seminars on music analysis, composition, and performance practice. After having taken a critical mass of such subjects students enter a qualifying examination preparation period, and, once successful, they start their dissertation research.

UCSD's Center for Research in Computing and the Arts (http://crca.ucsd.edu) offers an ideal research environment for graduate students in this area. The music department also provides extensive laboratory and computing support for computer music.

Critical Studies/ Experimental Practices

The Program in Critical Studies/Experimental Practices (CS/EP) explores what music is about over the widest possible range of traditions and possibilities. An exploration of experimental, Western, and non-Western music-making is combined with the critical examination of music and musical ideas within human societies.

This interactive environment encourages a cross-fertilization between diverse musical forms and the theoretical and critical discourses that surround them, often drawing in those who may not fit conventional categories of "composer" or "performer," or those whose work is not constrained by traditional disciplinary boundaries.

Thinking about music requires both analytic engagement with real music and the creative investigation of ideas relevant to its nature, creation, production, and reception. Core seminars explore multiple ways of thinking about music, including critical, cognitive, and intercultural approaches as well as traditional syntactical analysis. Recent seminars have included cross-culturalism in music, psychoacoustics, film and popular music, multimedia aesthetics, methodologies for improvisation, representations of sexuality and gender in music, ethics, music and theater, and contemporary theories of narrativity in music. Students are encouraged to share their scholarly, musical, and intermedia work in quarterly CS/EP forums.

Music-making in CS/EP encompasses both compositional and performance activities. Experimental performance workshops incorporate improvisation and such diverse elements as new technologies, video, dance, visual, and theatrical components to make music in a multiplicity of ways.

Student-generated projects and workshops are also an important component of the UCSD Gra-duate Program in CS/EP. Individual student interests and initiatives are welcomed by the faculty, who are expert in such diverse fields as cognitive psychology, computer-aided improvisation, ethnomusicology, historical development of Western music, and contemporary critical thought.

Performance

Fostering the creative, intelligent, and passionate performance of contemporary music is the mission of the Performance Program of the Department of Music. As once stated by founding faculty composer Robert Erickson, we at UCSD are a "community of musicians."

The performance of contemporary music is viewed as a creative act which balances expertise and exploration. Within this context, performers act and interact in a communal environment, working with faculty and student composers, collaborating in music technology, researching instrument design, improvising, and experimenting in performance practice, among many other pursuits.

Graduate performance students pursue either a master of arts or a doctor of musical arts degree in contemporary performance. The course of study for both programs involves the completion of required graduate seminars and intensive study with a mentoring faculty member. Students are encouraged to adopt a vigorous, exploratory orientation in their private study. Final degree requirements include a recital, or in the case of the DMA, two recitals and the presentation of personal performance research.

The work of graduate performance students forms an integral component of a rich musical environment which produces an astonishing quantity and variety of performances. Students may perform in SONOR (the university's contemporary music ensemble) or in SIRIUS, (the graduate student contemporary music group). The Performance Forum, a student-initiated concert series, provides an opportunity for students to present a wide variety of concerts of improvised music, world music, and music with technology. A strong, collaborative spirit between the Performance and Composition programs also yields many new works each year performed on New Music Forum concerts series.

Graduate Admissions

Students are admitted to begin in fall quarter only. The deadline for submission of ALL application materials is January 12. Failure to meet this deadline jeopardizes admission and financial support.

STEP 1 PRELIMINARY APPLICATION

The application process begins at the Department of Music Web site http://www.ucsd.edu/music with a preliminary online application. We encourage all applicants to apply as early as September.

STEP 2 PORTFOLIO

Music applicants must submit a portfolio consisting of the following by January 12 to: UCSD, Department of Music, MC 0326, La Jolla, CA 92093. Please include your most recent works as well as twentieth-century pieces, when possible.

- For **all** applicants, a repertory list of works (solo and chamber) performed or composed during the past few years and a sample of printed concert programs in which you have participated, either as performer, composer, or collaborator.
- For **all** applicants, a minimum of two papers illustrating writing ability in any of the following areas: musical analysis, criticism, aesthetics, music theory, or music technology.

—in addition—

- For **composition** applicants ONLY, a minimum of three scores of instrumental works with taped examples of the works being performed (These may include, but should not be exclusively, electroacoustic works.)
- For **computer music** and **CS/EP** applicants ONLY, appropriate documentation (e.g., papers, performances, intermedia works, computer programs, etc.) of prior work.

- For **performance** applicants ONLY, tapes or CD demonstrating the level of vocal and/or instrumental performance. In person auditions are desirable when possible, but not required.

STEP 3 UCSD APPLICATION FOR GRADUATE ADMISSION

All sections of the official online UCSD Application for Graduate Admission with the $60 non-refundable fee must be submitted by January 12. Applications must include all supporting documents:

- statement of purpose
- three letters of recommendation
- official transcripts
- Graduate Record Examination (GRE) required for **all** applicants.
- TOEFL (Test of English as a Foreign Language) required for all applicants whose country of citizenship does not have English as its primary language. Minimum score is 550 (or 213 for the computer-based exam).

Advisory Examinations

After completion of an advisory examination during Welcome Week, each new student will meet with the departmental M.A. or Ph.D. adviser. Students found to be deficient in any areas covered on the advisory examination (dictation, sight reading, keyboard proficiency, history, and literature) will be advised to remedy deficiencies during their first year.

Core Graduate Curriculum

All graduate students are required to take Music 201 (Projects in New Music Performance) as outlined under each area, Music 210 (Musical Analysis), Music 228 (Conducting)—optional for CS/EP students, and Music 291 (Problems and Methods of Music Research and Performance). Students who completed Music 210, 228, and 291 during their master's degree program at UCSD, do not need to retake those courses for their doctoral curriculum.

To assure that all requirements are being adequately met, all graduate students must make an appointment with the graduate staff adviser for a degree check no later than the winter quarter of the second year.

Master's Degree Program

The master of arts in music degree includes areas of emphasis in *Composition, Computer Music, Critical Studies/Experimental Practices (CS/EP)*, and *Performance*. The degree requires completion of at least thirty-six quarter units of graduate courses (courses numbered 201–299), including six units of Music 500 (Apprentice Teaching in Music) and six units of Music 299 (Advanced Research Projects and Independent Study) bearing directly on completion of the master's thesis. Master's students are expected to complete all requirements for the degree in six quarters of residence.

Course Requirements

In addition to the core graduate curriculum, all master's degree students are required to complete requirements in their area of emphasis:

COMPOSITION

1. Music 201 (A, B, C, D, E, or F)—must take at least two times.
2. Music 203ABC—successful completion of the jury process is necessary to get a passing grade in the corresponding seminar.
3. Music 203D—after successful completion of 203C, students must enroll in Music 203D (with their committee chair) every quarter until graduation.
4. Music 204—every quarter until graduation.
5. Music 206 and/or 207—a combination of any two courses.

COMPUTER MUSIC

1. Music 201 (A, B, C, D, E, or F)—must take at least two times.
2. Music 270A-B-C—must take within the first year of the program.
3. Music 270D—required every quarter of the second year.
4. Music 206, 207, and/or 267—a combination of any two courses.

CRITICAL STUDIES/EXPERIMENTAL PRACTICES

1. Music 201 (A, B, C, D, E, or F)—must take at least two times.
2. Music 205—every quarter until graduation.
3. Music 206 or 207—a combination of any two courses.
4. Music 208A-B-C—must take within the first year of the program.
5. Music 208D—one time during the second year.

PERFORMANCE

1. Music 201(A, B, C, D, E, or F) or 202—every quarter until graduation.
2. Music 206 or 207—a combination of any two courses.
3. Music 232—every quarter until graduation.
4. Music 245—every quarter in residence.

Master's Degree Completion Requirements

A folio of **three research papers** in professional format (normally to be written in connection with the courses the student will be taking) must be accepted by the student's committee prior to approval of the thesis.

M.A. candidates will present a **thesis** consisting of the following under the supervision of the student's committee chair in Music 299:

1. Candidates emphasizing *Composition* will prepare a folio of three chamber compositions together with tape recordings of at least two of them.
2. Candidates emphasizing *Computer Music* will write a research paper (thesis) and present a lecture-performance in which the scientific, technological, and musical aspects of an original computer music composition are documented, played, and discussed.
3. Candidates emphasizing *Critical Studies/Experimental Practices* will write an extended research paper (thesis) on a topic chosen with their committee chair.
4. Candidates emphasizing *Performance* will present a recital supported by lecture-quality notes. The program must be approved by the student's committee chair.

All of the above master's requirements must have final approval from the student's individual committee upon completion.

Doctoral Degree Program

Students of superior musical competence may pursue a program with emphasis in *Composition, Computer Music,* or *Critical Studies/Experimental Practices (CS/EP)* leading to the Ph.D. or doctor of musical arts (D.M.A.) degree in *Contemporary Music Performance.*

All doctoral students within the Department of Music must complete the Core Graduate Curriculum (outlined in the section above the Master's Degree Program) plus additional core requirements for the Ph.D. or D.M.A. program. These additional core requirements are:

1. Successful completion of an M.A. degree, including requirements equivalent to those described above for the M.A. in music. UCSD M.A. students who apply to the Ph.D./D.M.A. program must complete all departmental requirements, obtain OGSR approval, and file the M.A. degree at Geisel Library **before** enrolling in any Ph.D./D.M.A. level courses.
2. The Department of Music strongly recommends that entering students have acquired a reading ability in at least one of the standard reference foreign languages (French, German, Italian, or Spanish) in addition to their native language.
3. All Ph.D./D.M.A. students are required to complete six units of credit in Music 500 (Apprentice Teaching) unless the student has completed this requirement in UCSD's master's degree program.
4. After completing the qualifying examination, all students must remain in residence for at least three quarters, during which time they must enroll in twelve units of Music 299 (Advanced Research Projects and Independent Study) with their committee chair or members every quarter.

Course Requirements

In addition to the core graduate and Ph.D./D.M.A. curriculum, doctoral students (according to their area of emphasis) must complete the following courses prior to the qualifying examination:

COMPOSITION

1. Music 201 (A, B, C, D, E, or F)—must take at least two times.
2. Music 203A-B-C—successful completion of the jury process is necessary to get a passing grade in the corresponding seminar. Continuing students from the UCSD Composi-tion M.A. program may be excused from Music 203B-C by successfully completing Music 203A at the Ph.D. level.
3. Music 203D—after successful completion of 203C, students must enroll in Music 203D (with their committee chair) every quarter in residence.
4. Music 204—every quarter in residence.
5. Music 206 and/or 207—a combination of any three courses.
6. Music 209—must be taken at least three times.
7. Music 298—must complete at least six units.

COMPUTER MUSIC

1. Music 201 (A, B, C, D, E, or F)—must take at least two times.
2. Music 270A-B-C—must be taken within the first year of the program unless previously taken as a UCSD M.A. student.
3. Music 270D—after successful completion of 270C, students must enroll in Music 270D (with their committee chair) every quarter in residence.
4. Music 206, 207, 209, and/or 267—a combination of any six courses.

CRITICAL STUDIES/EXPERIMENTAL PRACTICES

1. Music 201 (A, B, C, D, E, or F)—must take at least two times.
2. Music 205—every quarter in residence.
3. Music 206 and/or 207—a combination of any three courses.
4. Music 208A-B-C—must take within the first year of the program unless previously taken as a UCSD M.A. student.
5. Music 208D—required at least three times during the Ph.D. program.
6. Music 209—must be taken at least three times.
7. Music 298—must complete at least six units.

PERFORMANCE

1. Music 201(A, B, C, D, E, or F) or 202—every quarter until completion of qualifying examination.
2. Music 206/207/209—as approved by D.M.A. adviser, a combination of any six seminars related to the primary and secondary area of specialization. Music 296 may be substituted for up to four seminars with permission of D.M.A. adviser.
3. Music 232—every quarter until completion of qualifying examination.
4. Music 245—every quarter in residence.
5. Music 250—must be taken at least three times.
6. Music 298—must complete at least six units.

Qualifying Examination/ Advancement to Candidacy

Requirements prior to taking the qualifying examination:

1. Completion of all Ph.D./D.M.A. required course work.
2. For Ph.D. students, one research paper judged to be of publishable quality must be completed prior to qualifying examinations. The subject of the publishable paper will be developed during the student's first two years and must be approved by the student's Ph.D. committee chair.
3. For *Composition* students, in addition to the publishable paper, a folio of not fewer than three compositions (not previously accepted for an M.A. degree) must be completed prior to qualifying examinations. A Third Year Forum presents, under departmental auspices, a work composed by each third-year Ph.D. composer in the four quarters since his or her second jury. As a part of preparation for this forum, each student composer is expected to have a faculty performer on his or her Ph.D. committee (as a regular member, or as an additional sixth member). The faculty performer is the student's performance mentor and guide in interfacing with the performance community.
4. For D.M.A. students, one major recital; plus either (a) an abstract of the thesis or research project which will be given to the Doctoral Committee at the qualifying examination; or (b) a substantial portion of the works from the student's first two "major recitals" will be presented at the qualifying examination.

The qualifying examination for all doctoral students will consist of the following:

- A written and oral defense of three questions provided by the Doctoral Committee pertaining to appropriate areas of specialization.

Ph.D./D.M.A. Degree Completion Requirements

1. For *Composition* students, completion of a major composition project.
2. For *CS/EP* and *Computer Music* students, completion of an acceptable dissertation.
3. For *D.M.A.* students, completion of a second major recital plus one of the following:

(a) thesis or research project; or (b) a concert that is innovative in design and/or content, and which is supported by a document containing extensive stylistic or analytical discussion of the program; or (c) a lecture/concert pertaining to innovative and/or original material, with appropriate documentation as determined by the committee, or (d) two approved chamber music concerts with appropriate documentation as determined by the committee.

4. A final public defense of the composition/dissertation/recitals.

Materials previously submitted for other degrees are not acceptable for submission for the Ph.D./D.M.A. degree.

Time Limit Policy for the Doctoral Degree

NORMATIVE TIME LIMITS

4 years: Students entering the Ph.D./D.M.A. program with a master's degree from another institution.

6 years: Students continuing into the Ph.D./D.M.A. program with a master's degree from UCSD. Time limit is calculated from the beginning of the M.A. program (i.e., 2 years for M.A. program plus 4 years normative time for Ph.D./D.M.A.).

SUPPORT TIME LIMITS

6 years: Students entering the Ph.D./D.M.A. program with a master's degree from another institution.

7 years: Students continuing into the Ph.D./D.M.A. program with a master's degree from UCSD. Time limit is calculated from the beginning of the M.A. program

TOTAL REGISTERED TIME LIMITS

6 years: Students entering the Ph.D./D.M.A. program with a master's degree from another institution.

8 years: Students continuing into the Ph.D./D.M.A. program with a master's degree from UCSD. Time limit is calculated from the beginning of the M.A. program

Students who have not completed all Ph.D. requirements within the maximum total registered time will no longer be permitted to register for classes.

Advising Office

Graduate Staff Adviser
Lori Bantz, Room 109
Mandeville Center, (858) 534-3279
lbantz@ucsd.edu

COURSES

NOTE: The following course offerings outline the general scope of our program. Not all courses are offered every year. It is essential that students work closely with departmental advisers when planning their degree programs.

LOWER-DIVISION

1A-B-C. Fundamentals of Music (4-4-4)
Primarily intended for students without extensive musical experience, this course develops musical abilities through a conceptual understanding of the structure of music together with listening exercises and techniques. Topics include musical notation, melodic transcription, scales, chords, intervals, keys, rhythm, meter, and rudiments of musical form. *Prerequisite: none.*

2A-B-C. Basic Musicianship (4-4-4)
Primarily intended for music majors. Development of basic skills: perception and notation of pitch and temporal relationships. Introduction to functional harmony. Studies in melodic writing. Drills in sight singing, rhythmic reading, and dictation. *Prerequisites: passing score on placement exam. Must be taken in sequence. Music majors must be concurrently enrolled in Music 2AK, 2BK, and 2CK (Basic Keyboard).*

2AK-BK-CK. Basic Keyboard (2-2-2)
Scales, chords, harmonic progressions, transposition, and simple pieces. *Prerequisites: concurrent enrollment in Music 2A, B, C.*

2JK. Jazz Keyboard (2)
This course will introduce basic voicings and voice leading, stylistically appropriate accompaniment, and basic chord substitution. For majors with a Jazz and the Music of the African Diaspora emphasis to be taken concurrently with Music 2C. *Prerequisites: Music 2AK and 2BK or passing proficiency exam, or consent of instructor. Concurrent enrollment in Music 2C. Majors only.*

4. Introduction to Western Music (4)
A brief survey of the history of Western Music from the Middle Ages to the present. Much attention will be paid to the direct experience of listening to music and attendance of concerts. Class consists of lectures, listening labs, and live performances. *Prerequisite: none.*

5. Introduction to Music Making (4)
A one-quarter course designed to discover musical potential and expand musical experience. No knowledge of music, notation, or instrumental skill is necessary. Small lab sessions present music through composing, improvising, and performing. Results take the form of works for tape, theatre, voices, or instruments. *Prerequisite: none.*

6. Electronic Music (4)
Lectures and listening sessions devoted to the most significant works of music realized through the use of computers and other electronic devices from the middle of this century through the present. *Prerequisite: none.*

7. Music, Science, and Computers (4)
Exploration of the interactions among music, science, and technology, including the history and current development of science and technology from the perspective of music. *Prerequisite: none.*

8. American Music (4)
A course designed to study the development of music in America. The focus will be on both the vernacular traditions including hymn singing, country music, jazz, big band, rock, etc., as well as the cultivated traditions of various composers from William Billings to John Cage. *Prerequisite: none.* (Offered in selected years.)

9. Symphony (4)
The symphonic masterworks course will consist of lectures and listening sessions devoted to a detailed discussion of a small number of recognized masterworks (e.g., Mozart, Beethoven, Berlioz, Stravinsky, Ligeti, etc.). *Prerequisite: none.* (Offered in selected years.)

10. Chamber Music (4)
Chamber Music will consist of lectures and listening sessions devoted to a detailed discussion of recognized chamber masterworks (e.g., Haydn, Mozart, Beethoven, Bartok, etc.). *Prerequisite: none.* (Offered in selected years.)

11. Folk Music (4)
A course on folk musics of the world, covered through lectures, films, and listening sessions devoted to detailed discussion of music indigenous to varying countries/areas of the world. Topics vary from year to year. May be repeated once for credit. *Prerequisite: none.*

12. Opera (4)
A study of opera masterworks that often coincide with operas presented in the San Diego Opera season. Class consists of lectures, listening labs, live performances, and opera on video. *Prerequisite: none.*

13AF. World Music/Africa (4)
A course that focuses on the music of Africa and on African ways of music making in the Diaspora to the Caribbean and South America. No prior technical knowledge of music is necessary. *Prerequisite: none.*

13AM. World Music/Multicultural America (4)
A study of music cultures in the United States, particularly Native American, Hispanic American, European American, Asian American, and Pacific Islanders from the perspective of ethnicity, origin, interaction, and the contribution of various ethnic groups to American musical life. No prior technical knowledge of music is necessary. *Prerequisite: none.*

13AS. World Music/Asia and Oceania (4)
Introduction to selected performance traditions of Asia and Oceania with links to local and visiting musicians from these cultures. No prior technical knowledge of music is necessary. *Prerequisite: none.*

14. Contemporary Music (4)
This course offers opportunities to prepare oneself for experiences with new music (through preview lectures), hear performances (by visiting or faculty artists), to discuss each event informally with a faculty panel: an effort to foster informed listening to the new in music. *Prerequisite: none.*

15. Popular Music (4)
A course on popular music from different time periods, covered through lectures, films, and listening sessions. Topics vary from year to year. May be repeated once for credit. *Prerequisite: none.*

32. Instrumental/Vocal Instruction (2)
Individual instruction on intermediate level in instrumental technique and repertory. For declared music majors and minors. Students must be simultaneously enrolled in a performance ensemble or non-performance music course. May be taken six times for credit. *Prerequisites: audition and department stamp.*

32G. Group Instrumental Instruction (2)
Group instruction in instrumental or vocal technique and repertory. Intermediate level. Intended for students who make an important contribution to Department of Music ensembles. *Prerequisites: Written recommendation of ensemble director and audition for performance faculty on first day of classes required. Department stamp required.* May be taken for credit six times. (Offered in selected years)

32V. Vocal Instruction (1)
Individual instruction on intermediate level in vocal technique and repertory. For declared music majors and minors. Students must be simultaneously enrolled in a performance ensemble or non-performance music course and in Music 32VM. May be taken six times for credit. *Prerequisites: audition and department stamp.*

32VM. Vocal Masterclass (1)
All students enrolled in voice lessons (32, 132, or 132C) perform for one another and their instructors. Students critique in-class performances, with emphasis on presentation, diction, dramatic effect, vocal quality, and musicality. *Prerequisites: concurrent enrollment in Music 32, 132V or 132C.*

33. Introduction to Composition (4)
This course is intended to provide the prerequisite knowledge necessary to pursue an emphasis in composition. Topics covered will include notation, calligraphy, instrumentation, orchestration, and twentieth-century music literature. *Prerequisite: Music 2A and 2B or consent of instructor.*

87. Freshman Seminar (1)
The Freshman Seminar Program is designed to provide new students with the opportunity to explore an intellectual topic with a faculty member in a small seminar setting. Freshman seminars are offered in all campus departments and undergraduate colleges, and topics vary from quarter to quarter. Enrollment is limited to 15 to 20 students, with preference given to entering freshmen.

95. Ensemble Performance (2)
Performance in an ensemble appropriate to student abilities and interests. Normally each section requires student participation for the whole academic year, with credit for participation each quarter. Sections of Music 95W have included: African drumming, Korean percussion, Indian sitar and tabla, koto, and Indonesian flute. Not all sections will be offered every year. May be repeated for credit. Grading on participation level, individual testing, comparative papers on repertoire covered, etc. *Prerequisites: audition and consent of instructor for each section.*

Note: Students in the Music 95 series courses may enroll with a letter grade option a total of twelve units for registered music majors and a total of six units for all other students; after which students may continue to enroll in Music 95 courses, but only with a P/NP grade option. There is one exception to the above grading policy. Music 95G, Gospel Choir, can *only* be taken for a P/NP grading option.

Section B. Instrument Choir (Not offered every year.)

Section C. Concert Choir

Section D. Symphonic Chorus

Section E. Chamber Orchestra

Section G. Gospel Choir

Section H. Chamber Opera (Not offered every year.)

Section JC. Jazz Chamber Ensembles

Section JL. Large Jazz Ensemble

Section K. Chamber Singers

Section L. Wind Ensemble

Section W. World Music Ensembles

ICAM 40. Introduction to Computing in the Arts (4)
(Cross-listed with VIS 40.) Introduction to conceptual uses and historical precedents for use of computers in art making. Introduces students to the program's computer facilities and teaches them basic computer skills. *Prerequisite: Visual Arts and ICAM majors and minors only.* **NOTE:** Materials Fee required.

UPPER-DIVISION

101A-B-C. Music Theory and Practice I (4-4-4)
Study of the materials and structures of music through hearing, analysis, writing, and performance. Writing in two voices (101A) and four voices (101B-C). Continues sight singing, dictation, and keyboard. *Prerequisites: Music 2C and 2CK, and passing grade on proficiency exam.*

102A-B-C. Music Theory and Practice II (4-4-4)
Advanced study of the materials and structures of music. Chromatic harmony and twentieth-century techniques. Aural discrimination, analysis, exercises, and short compositions. Continues sight singing, dictation, and keyboard. *Prerequisites: Music 101A-B-C. Department stamp required.*

103A-B-C. Seminar in Composition (4-4-4)
Individual projects in composition will be critically reviewed in seminar with fellow student and faculty composers. *Prerequisites: Music 2A-B-C and 33.*

103D-E-F. Honors Seminar in Composition (4-4-4)
Advanced individual projects for senior music majors pursuing honors in composition. Projects will be critically reviewed in seminar with fellow students and faculty composers. *Prerequisites: Music 103A-B-C and admission into the Department of Music Honors Program in compostion. Department stamp required.*

104. Jazz Transcription and Analysis (4)
An introduction to the practice of transcribing and analyzing improvised music. Discussion of music technique, style, aesthetics, and the ideology of transcription. *Prerequisites: Music 101A and 101B.*

105. Jazz Composition (4)
This course will explore a range of compositional possibilities from song forms to modal and more extended forms. May be repeated once for credit. *Prerequisite: Music 104 or consent of instructor.*

107. Critical Studies Seminar (4)
Explore music in relation to various traditions of critical thought and their methodologies, such as in literature, cultural studies, sociology, and philosophy. Readings and scores to be determined by the professor. *Prerequisite: upper-division standing or consent of instructor.*

110. Doing Ethnomusicology (4)
A how-to course in the practice and theory of studying the music of contemporary cultures. Students will record, document, analyze, and present music from their local environment. Designed for students in music, ethnic studies, anthropology, and the social sciences. *Prerequisite: none.* (Offered in selected years.)

111. Topics/World Music Traditions (4)
A study of particular regional musics in their repertory, cultural context, and interaction with other traditions. Topics vary. *Prerequisite: none.*

112. Topics in European Music Before 1750 (4)
This course will address topics in medieval, Renaissance, and Baroque music; topics will vary from year to year. May be repeated five times for credit. *Prerequisites: knowledge of music notation or consent of instructor; Music 4, 8-10 or 120 recommended.*

113. Topics in Classic, Romantic, and Modern Music (4)
This course will focus on Western music between 1750 and the early 20th century; topics will vary from year to year. May be repeated five times for credit. *Prerequisites: knowledge of music notation or consent of instructor; Music 4, 8-10 or 120 recommended.*

114. Music of the Twentieth Century (4)
An exploration of materials and methods used in the music of our time. There will be an extra discussion group for music majors. May be repeated once for credit. *Prerequisites: none.*

115. Women in Music (4)
A survey of the biographical, historical, sociological, and political issues affecting woman musicians, their creativity, their opportunities, and their perception by others. It compares and contrasts the work of women composers, performers, patrons, teachers, and writers on music from the Middle Ages through the present. *Prerequisite: consent of instructor.*

120A-B-C. Survey of Music History and Literature (4-4-4)
Intensive historical, analytical, and cultural-esthetic examination of music from Gregorian chant through the twentieth century. *Prerequisites: knowledge of music notation; Music 1C or 2C strongly recommended.*

126. Blues: An Oral Tradition (4)
This course will examine the development of the Blues from its roots in work-songs and the minstrel show to its flowering in the Mississippi Delta to the development of Urban Blues and the close relationship of the Blues with Jazz, Rhythm and Blues, and Rock and Roll. (Cross-listed with Ethnic Studies 178.) *Prerequisite: none.*

127A. Jazz Roots and Early Development (1900–1943) (4)
This course will trace the early development of Jazz and the diverse traditions which helped create this uniquely American art form. We will witness the emergence of Louis Armstrong in New Orleans and examine the composer's role in Jazz with Jelly Roll Morton and Duke Ellington. (Cross-listed with Ethnic Studies 179A.) *Prerequisite: none.*

127B. Jazz Since 1946: Freedom and Form (4)
This course will examine the evolution of Jazz from 1943 to the present. The course will survey the con-

trasting and competing styles in Jazz from BEBOP to COOL to the avant garde and fusion. (Cross-listed with Ethnic Studies 179B.) *Prerequisite: none.*

128. Principles and Practice of Conducting (4)
The theory and practice of instrumental and/or choral conducting as they have to do with basic baton techniques, score reading, interpretation, orchestration, program building, and functional analysis. Members of the class will be expected to demonstrate their knowledge in the conducting of a small ensemble performing literature from the eighteenth, nineteenth, and twentieth centuries. *Prerequisites: Music 2A-B-C and 101A-B-C. Department stamp required.*

129. Orchestration (4)
This course will give practical experience in orchestration. Students will study works from various eras of instrumental music and will demonstrate their knowledge by orchestrating works in the styles of these various eras, learning the capabilities, timbre, and articulation of all the instruments in the orchestra. *Prerequisite: Music 101B.*

130. Chamber Music Performance (2-4/0)
Instruction in the preparation of small group performances of representative instrumental and vocal chamber music literature. May be taken for credit six times, after which students must enroll for zero units. *Prerequisite: consent of instructor through audition.*

131. Advanced Improvisation Performance (4/0)
Master class instruction in advanced improvisation performance for declared majors and minors only or consent of instructor. Audition required at first class meeting. May be repeated six times for credit. *Prerequisites: consent of instructor through audition. Department stamp required.*

132. Pro-Seminar in Instrumental Instruction (4)
Individual or master class instruction in advanced instrumental performance. For declared music majors and minors. Students must be simultaneously enrolled in a performance ensemble or non-performance music course. May be taken six times for credit. *Prerequisites: audition and department stamp.*

132C. Vocal Coaching (3)
Individual instruction in advanced vocal coaching. Emphasis placed on diction and musical issues. For declared music majors and minors. Students must be simultaneously enrolled in the Vocal Masterclass, Music 32VM. May be taken six times for credit. *Prerequisites: at least one quarter of Music 132V and consent of instructor. Department stamp required.*

132R. Recital Preparation (4)
Advanced instrumental/vocal preparation for senior music majors pursuing honors in performance. Repertoire for a solo recital will be developed under the direction of the appropriate instrumental/vocal faculty member. Special audition required during Welcome Week preceding fall quarter. *Prerequisites: by audition only; Music 132. Department stamp required.*

132V. Pro-Seminar in Vocal Instruction (3)
Individual instruction in advanced vocal performance. For declared music majors and minors. Students must be simultaneously enrolled in a performance ensemble or non-performance music course and in the Vocal Masterclass, Music 32VM. May be taken six times for credit. *Prerequisites: audition and department stamp.*

133. Projects in New Music Performance (4)
Performance of new music of the twentieth century. Normally offered winter quarter only. Required a minimum of one time for all music majors. May be taken two times for credit. *Prerequisite: consent of instructor through audition.*

134. Symphonic Orchestra (4)
Repertoire is drawn from the classic symphonic literature of the eigtheenth, nineteenth, and twentieth centuries with a strong emphasis on recently composed and new music. Distinguished soloists, as well as The La Jolla Symphony Chorus, frequently appear with the orchestra. The La Jolla Symphony Orchestra performs two full-length programs each quarter, each program being performed twice. May be repeated six times for credit. *Prerequisites: audition and department stamp required.*

137 A-B-C. Jazz Theory and Improvisation (4-4-4)
Study of jazz theory and improvisation, focused on fundamental rhythmic, harmonic, melodic, and formal aspects of modern jazz style. Application of theoretical knowledge to instruments and concepts will be reinforced through listening, transcription work, and composition and improvisation exercises. *Prerequisites: Music 2A-B-C, proficiency exam, or consent of instructor.*

143. Department Seminar (1)
The department seminar serves both as a general department meeting and as a forum for the presentation of research and performances by visitors, faculty, and students. Required of all undergraduate music majors every quarter.

150. Jazz and the Music of the African Diaspora: Special Topics Seminar (4)
An in-depth writing and listening intensive investigation into a jazz or diaspora-related music history topic. Topics vary from year to year. May be repeated once for credit. *Prerequisite: Music 126, 127A-B, or consent of instructor.*

151. Race, Culture, and Social Change (4)
Aggrieved groups generate distinctive cultural expressions by turning negative ascription into positive affirmation and by transforming segregation into congregation. This course examines the role of cultural expressions in struggles for social change by these communities inside and outside the U.S. (Cross-listed with Ethnic Studies 108.) *Prerequisite: upper-division standing or consent of instructor.*

152. Hip Hop: The Politics of Culture (4)
Examination of hip-hop's music, technology, lyrics, and its influence in graffiti, film, music video, fiction, advertising, gender, corporate investment, government and censorship with a critical focus on race, gender, popular culture, and the politics of creative expression. (Cross-listed with Ethnic Studies 128.) *Pre-requisite: upper-division standing or consent of instructor.*

153. African Americans and the Mass Media (4)
Examination of media representations of African Americans from slavery to the present focusing on emergence and transmission of enduring stereotypes, their relationship to changing social, political, and economic frameworks, and African Americans' responses to and interpretations of these mediated images. (Cross-listed with Ethnic Studies 164.) *Prerequisite: upper-division standing or consent of instructor.*

154. Black Musicic/Black Texts: Communication and Cultural Expression (4)
Explores roles of music as a traditional form of communication among Africans, Afro-Americans, and West Indians: Special attention given to poetry of black music, including blues and other forms of vocal music expressive of contestatory political attitudes. (Cross-listed with Ethnic Studies 176 and Literature in English 187.) *Prerequisite: upper-division standing or consent of instructor.*

170. Musical Acoustics (4)
(Formerly Music 160A) An introduction to the acoustics of music with particular emphasis on contemporary digital techniques for understanding and manipulating sound. *Prerequisites: Music 1A, 2A, or 4. Cross-listed with ICAM 103.*

171. Computer Music I (4)
(Formerly Music 160C) A practical introduction to computer techniques for desktop audio, including audio editing, MIDI control, and real-time music algorithms using the MAX programming environment. *Prerequisite: Music 170; music majors, ICAM-music and ICAM-visual arts majors and minors, or consent of instructor.*

172. Computer Music II (4)
(Formerly Music 161) Computer synthesis techniques including wavetable and additive synthesis, waveshaping, and sampling. Transformation of musical sounds using filters, modulation, and delay effects. Fourier analysis of sounds. *Prerequisite: Music 171 (formerly Music 160C); music majors, ICAM-music and ICAM-visual arts majors and minors, or consent of instructor.*

173. Audio Production: Mixing and Editing (4)
(Formerly Music 162) Theoretical and practical aspects of recording, mixing, and editing sound for both musical and multimedia applications. Covers audio montage, equalization, effects processing, spatialization, mastering, and diffusion. *Prerequisite: Music 170 (formerly Music 160A); music majors, ICAM-music and ICAM-visual arts majors and minors, or consent of instructor.*

174. Recording/MIDI Studio Techniques (2-2-2)
(Formerly Music 164) This sequenced course surveys hardware and software resources in an advanced analog/digital audio and media studio. It is a required course for anyone who wishes to use the B108 Studio. Topics include: electronic and computer music, digital and analog audio signal mixing and manipulation, studio devices, interfacing, compositional applications, MIDI, synchronization, performance and studio techniques. Student projects demonstrate mastery of techniques studied. 174A: signals, mics, device based recording, mixing, monitoring; 174B: digital audio workstations, computer-based mixing and editing, soundfile transformation; 174C: MIDI, synchronization, sound-for-picture. *Prerequisites: MUS 174A: MUS 170; MUS 174B: MUS 174A; MUS 174C: MUS 174B; music majors, ICAM-music and ICAM-visual arts majors and minors, or consent of instructor.*

175. Musical Psychoacoustics (4)
(Formerly Music 160B) Survey of psychoacoustical phenomena, theories of hearing, and their relation to musical perception and cognition. Techniques of psychoacoustical experimentation. *Prerequisite: Music 170 (formerly Music 160A) recommended.*

176. Music Technology Seminar (4)
(Formerly Music 163) Selected topics in music technology and its application to composition and/or performance. Offerings vary according to faculty avail-

ability and interest. May be repeated for credit. *Prerequisites: Music 172 (formerly Music 161) and consent of instructor.*

195. Instructional Assistance (2)
Assisting in the instruction of an undergraduate music class under the direct and constant supervision of a faculty member. May be taken for credit three times. *Prerequisites: consent of instructor and departmental approval.*

198. Directed Group Study (1-4)
Concentrated inquiry into various problems not covered in the usual undergraduate courses. *Prerequisites: consent of instructor and department chair approval.* Pass/No Pass grade only.

199. Independent Study (1-4)
Independent reading, research, or creative work under the direction of a faculty member, provided no course covering the material to be studied already exists, and the study area derives from previous course work. *Prerequisites: consent of instructor and department chair approval. Department stamp required.* Pass/No Pass grade only. May be taken for credit two times.

ICAM 101. Digital Imaging: Image and Interactivity (4)
(Cross-listed with VIS 140). Introduction to digital image involving images, texts, and interactive display and operates both within computer mediated space (i.e., Web site) and in physical space (i.e., artist book). Interactive narrative and computer programming are explored. Materials fee required. *Prerequisites: VIS 40 or ICAM 40.* Open to media, ICAM, and studio majors; computing and ICAM minors only.

ICAM 102. Digital Media I: Time, Movement, Sound (4)
(Cross-listed with VIS 145A). Exploration of time dependent media components. Creation and manipulation of digital sound as well as moving images and their integration in multimedia works. Use of computer programming to control time is emphasized. Materials fee required. *Prerequisites: VIS 40 or ICAM 40 and VIS 140 or ICAM 101.* Open to media, and ICAM majors; ICAM minors only. Two production course limitation.

ICAM 103. Musical Acoustics (4)
(Cross-listed with MUS 170). An introduction to the acoustics of music with particular emphasis on contemporary digital techniques for understanding and manipulating sound. *Prerequisites: MUS 1A, 2A, or 4.*

ICAM 110. Computing in the Arts: Current Practice (4)
Designed around the presentations by visiting artists, critics, and scientists involved with contemporary issues related to computer arts. Lectures by the instructor and contextual readings provide background material for the visitor presentations. *Prerequisites: none.* **NOTE:** Materials fee required.

ICAM 120. Virtual Environments (4)
Students create virtual reality artworks. Projects may be done individually or in groups. Exploration of theoretical issues involved will underlie acquisition of techniques utilized in the construction of virtual realities. Materials fee required. *Prerequisites: VIS 145A or ICAM 102; CSE 11 recommended. Open to ICAM majors and minors only.* Two production course limitation.

ICAM 130. Seminar in Contemporary Computer Topics (4)
(Cross-listed with VIS 149). Topics relevant to computer-based art- and music-making, such as computer methods for making art/music, design of interactive systems, spatialization of visual/musical elements, critical studies. Topics will vary. May be repeated twice. Materials fee required. *Prerequisites: VIS 140 or ICAM 101; VIS 145A or ICAM 102 and MUS 170 or ICAM 103 recommended.* Open to media and ICAM majors; ICAM minors only. Two production course limitation.

ICAM 150. History of Art and Technology (4)
(Cross-listed with VIS 159). This course aims to provide historical context for computer arts by examining the interaction between the arts, media technologies, and sciences in different historical periods. Topics vary. Examples of topics which may be considered are: Renaissance perspective, the introduction of the printing press, the history of visual illusion in Western art, new physics and the avant-garde in the early twentieth century, futurism and technology, early electronic and computer art of the 1950s and 1960s. *Prerequisite: none.* **NOTE:** Materials fee required.

ICAM 160A. Senior Projects in Computer Arts I (4)
Students pursue projects of their own design over two quarters with support from faculty in a seminar environment. Project proposals are developed, informed by project development guidelines from real world examples. Collaborations are possible. Portfolio required for admissions. *Prerequisites: VIS 141B or VIS 145B or VIS 147B ior MUS 172.* Open to ICAM majors only. Department stamp required. Two production course limitation.

ICAM 160B. Senior Projects in Computer Arts II (4)
Continuation of ICAM 160A. Completion and presentation of independent projects along with documentation. *Prerequisite: ICAM 160A.* Open to ICAM majors only. Department stamp required. Two production course limitation.

ICAM 199. Special Studies (2/4)
Independent reading, research or creative work under direction of faculty member. *Prerequisites: department stamp and upper-division standing required.*

GRADUATE

All courses numbered 200 and above are intended for students admitted to the graduate program in music.

201A-B-C-D-E-F. Projects in New Music Performance (1-4, 1-4, 1-4, 1-4, 1-4, 1-4)
Performance of contemporary music. Different sections represent active performance ensembles. A core requirement for music graduate students as outlined in the curriculum.

202. Advanced Projects in Performance (1-4)
Advanced performance of new music with members of the performance faculty (SONOR). Students taking this course do not need to take Music 201 that quarter. Enrollment by consent of instructor/director of SONOR.

203A-B-C. Advanced Projects in Composition (6-6-6)
Meetings and laboratory sessions devoted to the study of composition.

203D. Advanced Projects in Composition (1-4)
Meetings on group basis with faculty composer in sessions devoted to the study of composition. *Prerequisites: 203A-B-C and consent of instructor.*

204. Focus on Composition (2)
The purpose of this seminar is to bring together the entire population of the graduate composition program (all students and faculty) for in-depth discussion of critical issues in music theory and composition. Each meeting will feature a formal presentation by either a student, faculty member, or visitor, followed by lively and challenging debate on relevant issues. *Prerequisite: consent of instructor.*

205. Focus on Critical Studies/Experimental Issues in Music (2)
The purpose of this seminar is to bring together CS/EP students and faculty for in-depth discussion(s) of theoretical, critical, and cultural issues in music. In conjunction with the seminar, each student not yet advanced to candidacy will meet with a faculty adviser to plan and prepare a presentation of his or her own work as part of a one-day CS/EP student symposium during the spring quarter.

206. Experimental Studies Seminar (4)
Seminars growing out of current faculty interests. The approach tends to be speculative and includes individual projects or papers as well as assigned readings. In the past, such areas as new instrumental and vocal resources, mixed media, and compositional linguistics have been offered.

207. Theoretical Studies Seminar (4)
Seminars on subject areas relating to the established dimensions of music and in which theoreticians have produced a substantial body of work. These include studies in analysis, timbre, rhythm, notation, and psychoacoustics. Offerings vary depending on faculty availability and interest. Analytical paper required.

208A. Critical Methods and Creative Identities (4)
The goal of this course is to develop critical thinking and self-reflexive inquiry through study of a diverse range of critical and scholarly traditions as they relate to music. Students are encouraged to investigate their own sense of identity and voice, as embodied in their creative work. *Prerequisite: consent of instructor.*

208B. Experimental Musical Practices (4)
This course examines, from social, cultural, historical and technological perspectives the current state of experimental musical practice. Meetings and laboratory sessions will explore alternative systems of musical organization, such as improvisation, computer-based multimedia, and interdisciplinary performance collaboration. *Prerequisite: consent of instructor.*

208C. World Musical Perception (4)
This seminar attempts to develop alternative procedures for the analysis of intercultural musicality. Methods and practices to be explored will involve computer technology, musical cognition and perception, and world music practices, as these relate to the elucidation and interrogation of notions of self and other, and tradition and innovation. *Prerequisite: consent of instructor.*

208D. Advanced Projects in CS/EP (1-4)
On a group or individual basis, this course provides an opportunity for students to create projects under the guidance of different faculty members each term. Enrollment in this course culminates in the development by the student of a portfolio of original work, or in a master's thesis. *Prerequisite: consent of instructor.*

209. Advanced Music Theory and Practice (4)
Advanced integrated studies in music theory; composition and styles study through analysis and performance. This course is intended primarily for doctoral students and may be taken by M.A. students only with special approval of M.A. adviser and course instructor. A major research or analytical publishable paper required.

210. Musical Analysis (4)
The analysis of complex music. The course will assume that the student has a background in traditional music analysis. The goal of the course is to investigate and develop analytical procedures that yield significant information about specific works of music, old and new. Reading, projects, and analytical papers. Normally offered fall quarter only.

228. Conducting (4)
This course will give practical experience in conducting a variety of works from various eras of instrumental and/or vocal music. Students will study problems of instrumental or vocal techniques, formal and expressive analysis of the music, and manners of rehearsal. Required of all graduate students. *Prerequisite: consent of instructor.* (Offered in selected years.)

229. Seminar in Orchestration (4)
A seminar to give practical experience in orchestration. Students will study works from various eras of instrumental music and will demonstrate their knowledge by orchestrating works in the styles of these various eras, learning the capabilities, timbre, and articulation of all the instruments in the orchestra. *Prerequisite: graduate standing.* (Offered in selected years.)

230. Chamber Music Performance (4)
Performance of representative chamber music literature, instrumental and/or vocal, through coached rehearsal and seminar studies. Course may be repeated for credit since the literature studied varies from quarter to quarter. *Prerequisite: consent of instructor.*

232. Pro-Seminar in Music Performance (4)
Individual or master class instruction in advanced instrumental/vocal performance. *Prerequisite: consent of instructor through audition.*

234. Symphonic Orchestra (4)
Repertoire is drawn from the classic symphonic literature of the eigtheenth, nineteenth, and twentieth centuries with a strong emphasis on recently composed and new music. Distinguished soloists, as well as The La Jolla Symphony Chorus, frequently appear with the orchestra. The La Jolla Symphony Orchestra performs two full-length programs each quarter, each program being performed twice. May be repeated six times for credit. *Prerequisites: audition and department stamp required.*

245. Focus on Performance (2)
The purpose of this seminar is to bring together performance students, faculty, and guests for discussion, presentation of student and faculty projects, performances by guest artists, and master classes with different members of the performance faculty. *Prerequisite: consent of instructor.*

250. Special Projects (1-12)
An umbrella course offered to music graduate students in lieu of normal seminar offerings. Topics will be generated by faculty and graduate students and submitted in December each year for review by faculty. Students may register for up to four units of a specialized research topic with given faculty. May be taken for up to twelve units a quarter.

267. Advanced Music Technology Seminar (4)
Advanced topics in music technology and its application to composition and/or performance. Offerings vary according to faculty availability and interest. May be repeated for credit. *Prerequisites: Music 173 or equivalent and consent of instructor.*

270A. Digital Audio Processing (4)
Digital techniques for analysis, synthesis, and processing of musical sounds. Sampling theory. Software synthesis techniques. Digital filter design. The short-time Fourier transform. Numerical accuracy considerations. *Prerequisite: consent of instructor.*

270B. Musical Cognitive Science (4)
Theoretical bases for analyzing musical sound. Approaches to perception and cognition, including psychoacoustics and information processing, both ecological and computational. Models of audition including Helmholtz's consonance/dissonance theory and Bregman's streaming model. Musical cognition theories of Lerdahl and Narmour. Neural network models of music perception and cognition. Models of rhythm. The problem of timbre and timbre perception. *Prerequisite: consent of instructor.*

270C. Compositional Algorithms (4)
Transformations in musical composition; series and intervalic structures; serial approaches to rhythm and dynamic. The stochastic music of Xenakis and Cage. Hiller's automatic composition. Improvisational models. Computer analysis of musical style. Neurally inspired and other quasiparallel algorithms. *Prerequisite: consent of instructor.*

270D. Advanced Projects in Computer Music (4)
Meetings on group basis with computer music faculty in support of individual student research projects. *Prerequisites: consent of instructor and completion of Music 270A-B-C.*

271. Survey of Electronic Music Techniques (2)
A hands-on encounter with several important works from the classic electronic repertory, showing a representative subset of the electronic techniques available to musicians. Intended primarily for students in areas other than computer music. *Prerequisite: none.* (S/U grade option only.)

291. Problems and Methods of Music Research and Performance (2)
The course will give practical experience in historical research, including use of important source materials, evaluation of editions, and examination of performance practice problems. (S/U grade option only.)

292. Academic Writing (1-4)
Individual and/or group work on particular academic writing projects in music. *Prerequisite: consent of instructor.*

296. Directed Group Research in Performance (4)
This group research seminar involves the investigation and exploration of new and experimental performance concerns. Areas could include: improvisation, graphic notation, performance electronics, and working with combined media (such as dance, poetry, and theater). (S/U grade option only.)

298. Directed Research (1-4)
Individual research. (S/U grades permitted.) May be repeated for credit. Enrollment by consent of instructor only.

299. Advanced Research Projects and Independent Study (1-12)
Individual research projects relevant to the student's selected area of graduate interest conducted in continuing relationship with a faculty adviser in preparation of the master's thesis or doctoral dissertation. (S/U grades permitted.)

500. Apprentice Teaching (1-4)
Participation in the undergraduate teaching program is required of all graduate students at the equivalent of 25 percent time for three quarters (six units is required for all graduate students).

501. Apprentice Teaching—Nondepartmental (4)
Consideration and development of pedagogical methods appropriate to undergraduate teaching.

Neurosciences

OFFICE: Building #1, School of Medicine,
Mail code 0662
http://medicine.ucsd.edu/neurosci

Professors

Henry Abarbanel, Ph.D., *Physics*
Thomas Albright, Ph.D., *Adjunct/Psychology and Neurosciences*
Ursula Bellugi, Ed.D., *Adjunct/Psychology*
Darwin K. Berg, Ph.D., *Biology-Neurobiology Section*
Floyd E. Bloom, M.D., *Adjunct/Neurosciences and Psychiatry*
Karen Britton, M.D., Ph.D., *In-Residence/Psychiatry*
Joan Heller Brown, Ph.D., *Pharmacology*
Laurence L. Brunton, Ph.D., *Pharmacology and Medicine*
Theodore H. Bullock, Ph.D., *Emeritus/Neurosciences*
Don Cleveland, Ph.D., *Medicine/Neurosciences*
Jody Corey-Bloom, M.D./Ph.D., *Clinical/Neurosciences*
Eric Courchesne, Ph.D., *Neurosciences*
J. Anthony Deutsch, Ph.D., *Emeritus/Psychology*
Mark H. Ellisman, Ph.D., *Neurosciences*
Edmund J. Fantino, Ph.D., *Psychology*
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Douglas R. Galasko, M.D., *In-Residence/Neurosciences*
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J. Christian Gillin, M.D., *Psychiatry*
Lawrence S.B. Goldstein, Ph.D., *Cellular and Molecular Medicine*
Murray Goodman, Ph.D., *Chemistry and Biochemistry*
Philip M. Groves, Ph.D., *Psychiatry and Neuroscience*

Richard H. Haas, M.D., *Neurosciences and Pediatrics*
Lawrence A. Hansen, M.D., *Pathology and Neurosciences*
Richard L. Hauger, M.D., *Psychiatry*
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Steven A. Hillyard, Ph.D., *Neurosciences and Adjunct/Psychology*
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Vicente J. Iragui-Madoz, M.D., Ph.D., *Clinical Neurosciences*
Dilip J. Jeste, M.D., *In-Residence and Psychiatry and Adjunct/Neurosciences*
Michael W. Kalichman, Ph.D., *Adjunct/Pathology*
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Edward Koo, M.D., *Neurosciences*
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Ronald Kuczenski, Ph.D., *In-Residence/Psychiatry and Adjunct/Neurosciences*
Marta Kutas, Ph.D., *Cognitive Science and Adjunct/Neurosciences*
Greg Lemke, Ph.D., *Adjunct/Neurosciences*
Stuart A. Lipton, M.D., Ph.D., *Adjunct/Neurosciences*
John Liu, Ph.D., *Adjunct/Ophthalmology*
Robert B. Livingston, M.D., *Emeritus/Neurosciences*
Patrick D. Lyden, M.D., *In-Residence/Neurosciences*
Eliezer Masliah, M.D., *Neurosciences and Pathology*
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Leon J. Thal, M.D., *Chair, Neurosciences*
Ronald G. Thomas, Ph.D., *Adjunct/Family and Preventive Medicine and Neurosciences*
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Wylie Vale, Ph.D., *Adjunct/Biology and Medicine*
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Paul Slesinger, Ph.D., *Adjunct/Neurosciences*
Jane Sullivan, Ph.D., *Adjunct/Neurosciences*
Anthony Wynshaw-Boris, M.D./Ph.D., *Pediatrics and Medicine*

The Graduate Program

The group in neurosciences accepts candidates for the Ph.D. degree who have undergrad-

uate majors in such disciplines as biology, chemistry, engineering, microbiology, mathematics, physics, psychology, and zoology. A desire and competence to understand how the nervous system functions is more important than previous background and training.

Doctoral Degree Program

Students in this program receive guidance and instruction from a campuswide group of faculty interested in nervous system mechanisms. Each student, in consultation with an advisory committee, selects courses relevant to his or her research interests and goals. The selection will include formal courses listed in this catalog and informal seminars offered by the department. A regular schedule of rotation through the laboratories of faculty members is a feature of the first year; the student is exposed in this way to the various approaches, techniques, and disciplines represented on the campus.

Course Work

By the time of the minor proposition (see below), students are expected to demonstrate competence in the basics of neuroscience by taking five quarters of mandatory course work—three quarters of Basic Neuroscience (Neurosci. 200 A-B-C), and one quarter each of Neuroanatomy Lab (Neurosci. 257) and Statistical Methods and Experimental Design (Neurosci. 225). In addition, students choose among three of six remaining courses: Molecular and Cellular Neuroendocrinology (Neurosci. 222), Molecular and Cellular Neurochemistry (Neurosci. 234), Neuropsychopharmacology (Neurosci. 277), Molecular and Cellular Neurobiology (Neurosci. 268), Behavioral Neuroscience (Neurosci. 264), and Developmental Neuroscience (Neurosci. 263). Students are also permitted to substitute previous courses that are similar to the Neurosciences core courses. Such a substitution would require approval of the graduate advisor in consultation with the Core Curriculum Committee and course instructor(s).

Minor Proposition

The purpose of this examination is to test the student's ability to choose a problem in the neurosciences and propose an experimental approach to its solution. The problem should be broad, requiring experimental approaches from more than one discipline. The problem should be outside the area of the student's anticipated dissertation research. Students will be required to demonstrate a working knowledge of the disciplines involved in the minor proposition.

Oral defense of the minor proposition will be required at the end of the spring quarter of the second year of study. Exemptions may be granted to entering students already holding a master's degree.

Dissertation

During the second year, students are expected to propose and initiate work on a dissertation problem under the guidance of a faculty preceptor. The neurosciences group at UCSD currently conducts animal research and clinical studies in the fields of neuroanatomy, neurochemistry, neuropharmacology, neurophysiology, comparative neurology, physiology of excitable membranes, synaptic transmission, neuronal integration and coding, nervous system tissue culture, neuroimmunology, brain function, sensory physiology, motor mechanism, and systems analysis as applied to neurological problems.

Qualifying Examination

This examination, a university requirement, focuses on the proposed research that the student will undertake for his or her dissertation. This examination is conducted by the approved doctoral committee.

Dissertation Examination

The required formalities listed in the *Instruction for Preparation and Submission of Doctoral Dissertations* issued by the Office of Graduate Studies and Research to students should be followed closely. The final examination includes both a public presentation followed by a closed defense of the dissertation with members of the Committee.

Teaching

Students are required to teach and to develop their talents as teachers. To this end, opportunities to lecture and to assist in laboratory exercises and demonstrations are provided.

Ph.D. Time Limit Policies

Students must advance to candidacy by the end of four years. Total university support cannot exceed six years. Total registered time at UCSD cannot exceed seven years.

COURSES

UNDERGRADUATE

199. Independent Research (2 or 4)
Laboratory research under the supervision of individual members of the faculty of the neurosciences department in one or a combination of neurosciences disciplines, e.g., neuroanatomy, neurophysiology, neurochemistry, neuropharmacology. (P/NP grades only.) *Prerequisite: consent of department chair.* (F,W,S)

GRADUATE

200A-B-C. Basic Neuroscience (4-4-4)
These courses are designed for graduate students in the neurosciences and other departments that are part of the interdisciplinary program (i.e., Biology, Cog. Sci.). These courses have been designed to cover as much basic neuroscience as possible in *three quarters of study*. It will combine two three-hour meetings each week with a 1.5 hour lecture and a 1.5 hour discussion of papers. These will be required courses for all first-year neurosciences graduate students. Biology will cross-list courses under Biology headings, making it a requirement of first year Biology graduate students. *Prerequisite: graduate student or consent of instructor.* (F,W,S)

221. Advanced Topics in Neurosciences (2)
Specialized advanced topic areas in neurosciences will be addressed in an interactive seminar course format. A different specific topic will be considered each quarter as announced in advance. Students will each present an aspect of the topic area and participate in discussions. *Prerequisite: graduate student or consent of instructor.* (F,W,S)

222. Molecular and Cellular Neuroendocrinology (4)
This course will examine the role of the CNS in controlling reproductive functions, stress, growth and behavior, with emphasis on the cellular and molecular mechanisms of neuroendocrine function. The lectures will be given by experts on each of the topic subjects. Lectures will include a basic introduction on the topic followed by a description of the current research in the area.

225. Statistical Methods and Experimental Design (2)
This course is designed for graduate students in the neurosciences, but will address issues of statistical methods and experiment design for investigators working in any field of biological research. The course will combine lectures, discussion, and practical examples drawn from the experience of the participant. *Prerequisite: graduate student in the neuroscience graduate program or consent of the instructor.* (F)

233. Comparative Vertebrate Neurobiology (4)
Survey of the organization and evolution of vertebrate nervous systems. *Prerequisite: consent of instructor.* (S/U grades only.) (W)

234. Molecular and Cellular Neurochemistry (4)
Topics include membrane and nerve function in nervous system, structure and function of receptors for neurotransmitters, role of cAMP as a second messenger in the nervous system, synthesis and processing of neuropeptides.

235. Neurobiology of the Chemical Senses (1)
This lecture and seminar course surveys the neuroanatomy and neurophysiology of the central and peripheral taste and olfactory systems. Plasticity of the mature and developing chemosensory systems will also be covered. Behavioral studies of sensory function will be related to psychophysical studies in humans, including those directed at evaluating clinical chemosensory disorders. Students are expected to discuss readings of journal articles. (S)

241. Ethics and Survival Skills in Academia (2-4)
This course will cover "ethical" issues in academia, including dishonesty, plagiarism, attribution, sexual misconduct, etc. We will also discuss "survival" issues, including job hunting, grant preparation, journal reviews, writing letters of recommendation, mentoring, etc. (W)

243. Physiological Basis of Human Information (2)
Psychological processes including attention, perception, and memory will be studied in connection with event-related potentials of the human brain. The interrelations among psychological and physiological events will be explored in order to arrive at unified concepts of human information processing. *Prerequisites: Neurosci. 238 or Psych. 231, and consent of instructor.* (S/U grades only.) (F)

251. Scientific Communication (2)
(Same as SIO 292) Forms of scientific communication, practical exercise in scientific writing and short oral communication, and in criticism and editing, preparation of illustrations, preparation of proposals; scientific societies and the history of scientific communication. Examples from any field of science, most commonly biology, marine biology, ecology, and neuroscience. *Prerequisite: graduate status in science.* (S/U grades only.) (S)

253. Clinical Neuroanatomy (1)
Review of neuroanatomy, with emphasis on clinical correlations. Pertinent physiological, chemical, and clinical information will be included and functional organization will be stressed. It is essential that students be familiar with neuroanatomical nomenclature. *Prerequisite: medical student, graduate student, intern, resident, or consent of instructor.* (S/U grades only.)

256. Mammalian Neuroanatomy (4)
Lectures presenting the basic features of the anatomy of the mammalian nervous system. This will include consideration of cellular components, development, topographic anatomy, and a detailed presentation of the organization of functional systems. *Prerequisite: graduate status or consent of instructor.* (S/U grades only.) (F) (not offered in 2000–2001)

257. Mammalian Neuroanatomy Laboratory (4)
Neuroanatomy laboratory course taught in conjunction with Mammalian Neuroanatomy (256). Laboratories deal with gross and microscopic neuroanatomy of brain systems. Sessions include microscopic analysis of histological sections and observations and dissections of human brain material. *Prerequisite: Neuroanatomy 256 or concurrent enrollment.* (S/U grades permitted.) (W)

259. Workshop in Electron Microscopy (4)
This course is to introduce graduate students in the neurosciences to research methods used in electron microscopy (EM) through one hour of formal lecture, one hour of seminar, three hours of demonstration, and three hours of supervised laboratory work per week. Students will become familiar with sectioning EM, scanning EM, and freeze-fracture EM. *Prerequisites: graduate-student standing in neurosciences doctoral program and consent of instructor.* Enrollment limited. (S/U grades only.) (S)

263. Developmental Neurobiology (3)
(Same as Biology 258.) Cellular and developmental aspects of the nervous system. Methods of investigation and culture approaches. Basic neuroembryology and selected examples of regional developments. Neuroglial cells and neuron-glia interactions. Extrinsic controls of survival growth and maturation of neural cells. Neurite growth and synapse formation. Potential for plasticity and regeneration in the nervous system. *Prerequisite: graduate students or consent of instructor.* (S)

264. Behavioral Neuroscience (5)
The course is to cover different areas of behavioral biology, such as ethology, behavioral biology, learning and memory, perception psychophysics. Some outside reading will be required. *Prerequisite: medical student, graduate student, or consent of instructor.* (W)

268. Molecular and Cellular Neurobiology (4)
This course focuses on cellular anatomy of the nervous system at the molecular level. The lectures will communicate current molecular genetic and cell biological approaches used to study the specialized structures and cell types of nervous tissue. Topics will include cell organelles; chromatin structure/function; gene expression/regulation; cytoskeleton and membrane interactions; signal transduction/receptors, channels and pumps; cellular junctions/synapses; node of Ranvier; and neuroplasmic transport. *Prerequisites: neurochemistry, neuroanatomy, biochemistry.* (F)

269. Electroencephalography and Clinical Neurophysiology (1)
Using the Journal of Electroencephalography and Clinical Neurophysiology as a core text, subjects chosen from the journal will be discussed and critically evaluated by the participants, and the literature pertinent to each topic reviewed. *Prerequisites: Neurosci. 238, Basic Neurology (205), neurology resident, or consent of instructor.* (F,W,S)

274. Neurobiology of Cognitive Developmental Disorders (2)
Neurobiological foundation of developmental disorders in information processing including infantile autism, developmental dysphasia, attention deficit disorder, and childhood schizophrenia. Neurophysiologi-cal, neuroanatomical, and psychological evidence will be explored. *Prerequisite: undergraduate or graduate course in neurobiology.* (S/U grades permitted.)

276. Neuroscience Research Rounds (2)
Neurosciences group faculty members and graduate students will present and discuss ongoing research. Attendance will be mandatory for first- and second-year graduate students. Faculty, advanced graduate students, medical students, postdoctoral trainees, and other interested parties are encouraged to attend. (F,W,S)

277. Neuropsychopharmacology (4)
An examination of the molecular and biochemical bases of drug and transmitter action. The course is devoted to receptor mechanisms, neuropharmacology, and drug action on excitable tissues. (S)

296. Neurosciences Research Rotation (1-12)
Independent study. (S/U grades only.) (F,W,S)

298. Neurosciences Independent Study Project (ISP) (1-12)
Prerequisite: approved ISP proposal. (F,W,S)

299. Neurosciences Research (1-12)
Independent study. (S/U grades only.) (F,W,S)

401. Neurology General Clinical Selective Clerkship (7)
Provides opportunities for practical application of neurological skills to the understanding and treatment of a variety of clinical disorders of the nervous system. *Prerequisite: successful completion of first two years of medical school.* (F,W,S)

426. Subintern Pediatric Neurology (7)
Subinterns are responsible for the primary care of hospitilized pediatric neurology patients under the direct resident and attending physician supervision. They will perform procedures such as lumbar puncture and participate in night call, daily teaching round, neurology Grand Rounds, and Journal Clubs. *Prerequisite: Neurology 401 or consent of instructor.* (F,W,S)

427. Neurology Outpatient Clerkship (7)
The student will rotate through the general and subspecialty (stroke, epilepsy, headache, nerve, and muscle) neurology clinics based at UCSD Medical Center. Lectures and clinical conferences will be attended as well. *Prerequisite: Neurosciences 401 or equivalent.* (F,W,S)

496. Clinical Independent Study (1-12)
Independent clinical study for medical students (S/U grades only.) (F,W,S)

500. Apprenticeship Teaching (1-4)
Participation in the department teaching program is required of all students working toward a Ph.D. degree. In general, students are not expected to teach in the first year, but are required to serve as teaching assistants or tutors for one quarter at any time during their subsequent years of training. The amount of teaching required is equivalent to the duties expected of a 50 percent assistant for one quarter. *Prerequisite: neurosciences graduate students. (S/U grades only.)* (F,W,S)

Philosophy

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Professors

Georgios H. Anagnostopoulos, Ph.D.
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William Bechtel, Ph.D.
David O. Brink, Ph.D.
Nancy D. Cartwright, Ph.D.
Patricia Smith Churchland, B.Phil., *Chair and Presidential Professor of Philosophy*
Paul M. Churchland, Ph.D.

Gerald D. Doppelt, Ph.D., *Academic Senate Distinguished Teaching Award*
Donald P. Rutherford, Ph.D.
Gila Sher, Ph.D.

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Samuel C. Rickless, Ph.D.
Eric Watkins, Ph.D.

Assistant Professors

Jonathan P. Cohen, Ph.D.
Dana Nelkin, Ph.D.
Agustín Rayo, Ph.D.

Professors Emeriti

Henry E. Allison, Ph.D., *Research Professor (not in-residence)*
Edward N. Lee, Ph.D., *Professor Emeritus*
Frederick A. Olafson, Ph.D., *Professor Emeritus*
Avrum Stroll, Ph.D., *Research Professor*

Introduction to the Department

Philosophy addresses some of the most basic questions humans ask about the world. Some questions are very broad, such as how can minds know about the external world, themselves, and other minds? How can we arrive at reasonable answers to ethical questions about right and wrong? What distinguishes science from other kinds of knowledge and are there limits to science? What is the role of moral choice and values in human life? Do standards of truth and logic apply in areas such as religion, art, politics, and law?

Philosophy also seeks answers to particular problems in specific areas of science, medicine, law, ethics, and technology. For example, it explores the ways that modern physics impacts our notions of space, time, causation, and nature itself. It considers the ways that neuroscience and genetics impact the traditional ideas about free will and responsibility. It debates the limits of democratic governments in regulating individuals' conduct. It wrestles with problems about the right to die and the varied responsibilities of medical professionals. It inquires into the relation between science and religion. Related issues concern privacy, the limits of private property, and who should have access to what information.

Career Guidance

Philosophy is a broad field with diverse subfields. Some students may want to pursue a general course of study for the major, sampling courses across several of these distinct subfields. This strategy develops a solid foundation for graduate work in philosophy and for any career that requires breadth of knowledge, intellectual flexibility, as well as communicative and analytic skills.

Other students may wish to pursue a more specialized program of studies. Below are descriptions of several areas of emphasis within philosophy. These illustrate the possibilities of developing your own coherent and focused set of courses that fulfill the requirements for the major in ways that are tailored to your specific intellectual and career interests. Philosophy is preparation for a wide range of careers—including science, law, medicine, teaching, business, and public policy.

Choosing a philosophy major is an excellent way to follow a disciplined and rigorous course of study that joins the breadth of a traditional college education with specialization in a chosen area.

Undergraduate Program—Major

The Department of Philosophy offers the degree of bachelor of arts (B.A.) in philosophy for the undergraduate major. A major in philosophy requires a total of fifteen philosophy courses, at least twelve of which must be upper-division (courses numbered 100 and above). Up to two upper-division courses outside of philosophy can count among the twelve required for the major if they are drawn from a related field and contribute to the major's philosophical program; such credit must be approved by the undergraduate adviser. Honors and directed study courses (Philosophy 191–199) may not be used to satisfy the major requirement of fifteen philosophy courses. Major requirements may be met by examination.

There is no standard or required introduction to philosophy or the major. The department offers a variety of lower-division courses and sequences (numbered 1–99), any of which could be a suitable introduction to philosophy.

At the upper-division level, majors are encouraged to take courses in the central areas of philosophical study:

Metaphysics and Epistemology
Law, Ethics, and Politics
Philosophy of Science and Logic
History of Philosophy

Though many upper-division courses have no prerequisite, any combination of three lower-division courses would provide a good foundation for taking most upper-division courses.

Core Requirements for the Major

1. History of Philosophy. Majors must complete three courses in the history of philosophy. At least one course must be in ancient philosophy (courses 31, 100–103) and one course must be in modern philosophy (courses 32–33 and 104–107). This requirement can be met by taking the lower-division sequence 31, 32, 33 or by taking any suitable combination of courses from the sequences 31–33 and 100–110.
2. Logic. Philosophy 10 and Philosophy 120 are required of all majors. Because Philosophy 120 is a prerequisite for a variety of upper-division courses, prospective majors are strongly encouraged to take it and Philosophy 10 as early as possible.
3. Moral and Political Philosophy. Majors must take at least one upper-division course in moral or political philosophy from among Philosophy 160, 161, 166, or 167.
4. Metaphysics and Epistemology. Majors must take at least one upper-division course in traditional areas of analytic philosophy—metaphysics, epistemology, philosophy of language, and philosophy of mind—from among Philosophy 130, 132, 134, or 136.

Optional Areas of Emphasis in the Major

The Department of Philosophy offers four optional areas of emphasis within the major, as described below. Students selecting an optional area of emphasis for the major must take and pass five of the courses listed under that area. Courses taken to complete an area of emphasis are counted toward the fifteen courses required for the major. Particular courses may be applied both to the completion of the area of emphasis

and in fulfillment of a core requirement for the major. Students should be aware, as they plan their course of study, that only some of the courses listed for an area of emphasis will be taught in any given year.

The department encourages students considering a philosophy major to consult with the assistant director of the philosophy undergraduate program and the philosophy faculty undergraduate adviser to plan a program of study that is suitable to their particular interests and needs. The department Web site http://philosophy.ucsd.edu provides additional information about courses falling within each area of emphasis. The optional areas of emphasis are:

1. Law, Ethics, and Society

This area targets the nature and source of our moral rights and obligations, the authority of the state and law, the basis of value and goodness. Several courses in this area target ethical issues in medicine, the environment, technological change, economic inequality, and matters concerning race, gender, class, ethnicity, and nationality. In this area, students will learn how moral and legal reasoning can reshape the political debates over abortion, the death penalty, privacy on the Internet, genetic testing, religious tolerance, free speech, affirmative action, and other issues.

This area is excellent preparation for law school as well as for postgraduate study and careers in public policy.

125. Games and Decisions
148. Philosophy and the Environment
152. Philosophy of Social Science
160. Ethical Theory
161. Topics in the History of Ethics
162. Contemporary Moral Issues
163. Biomedical Ethics
164. Technology and Human Values
166. Classics in Political Philosophy
167. Contemporary Political Philosophy
168. Philosophy of Law
169. Feminism and Philosophy
170. Philosophy and Race
182. Marx and Marxism

2. Science, Technology, and Medicine

This emphasis focuses on the insights and challenges presented by science. Modern science and technologies affect our view of ourselves and of nature, introducing novel promises and problems. For instance, how do we balance technical, economic, environmental, and ethical values in making decisions concerning which technologies or drugs to develop? Modern science has also changed our understanding of nature. Quantum physics, the genetic revolution, and neuroscience (to name a few) present problems and have important implications for human life. Finally, there are questions about science itself. What are the methods of modern science? Do they vary from one science to another? Can the sciences be value free?

This area will appeal especially to those students interested in pursuing careers in philosophy, science, clinical medicine, medical research, the social sciences, science journalism, and public policy.

123. Philosophy of Logic
145. Philosophy of Science
146. Philosophy of Physics
147. Philosophy of Biology
148. Philosophy and the Environment
149. Philosophy of Psychology
150. Philosophy of Cognitive Sciences
151. Philosophy of Neuroscience
152. Philosophy of Social Science
153. Philosophy of History
163. Biomedical Ethics
164. Technology and Human Values

3. Mind, Brain, and Cognitive Sciences

Traditional epistemology (the theory of how and what we know) and philosophy of mind (the theory of that-which-perceives-and-thinks) have recently been joined by several scientific disciplines in a collective search for illuminating theories. Psychology, cognitive neurobiology, computer science, and sociology have all made explosive contributions to a tradition as old as Plato and Aristotle. For example, our growing understanding of the biological brain has given new life to our traditional attempts to understand the nature of the mind. New accounts of the various mechanisms of cognition—both at the cellular and the social levels—have provided entirely new perspectives on the nature of consciousness, the self, knowledge and free will, and on the nature of science itself.

This area is excellent preparation for careers in cognitive science, neuroscience, artificial intelligence, science journalism, and philosophy.

132. Epistemology
134. Philosophy of Language
136. Philosophy of Mind
138. Consciousness
139. The Nature of Representation
145. Philosophy of Science
147. Philosophy of Biology
149. Philosophy of Psychology
150. Philosophy of Cognitive Sciences
151. Philosophy of Neuroscience
180. Phenomenology

4. Historical Perspectives on Philosophy, Science, and Religion

Throughout its history, philosophy has developed in a complex relationship with the natural sciences and religion. Philosophical ideas have both contributed to and challenged our understanding of nature and God, and developments in the sciences and religion have posed new challenges for philosophical thinking. The historical perspectives emphasis focuses on the fertile interplay between philosophy, science, and religion in several key periods: ancient Greece, the Scientific Revolution, and Enlightenment and post-Enlightenment Europe. The aim is not simply to document the history of philosophical ideas, but to use this history as a way of better understanding contemporary debates about the basic questions of human life.

This area prepares students for postgraduate work in philosophy, and for any career that requires breadth of knowledge, intellectual flexibility, as well as communicative and analytical skills.

100. Plato
101. Aristotle
102. Hellenistic Philosophy
104. The Rationalists
105. The Empiricists
106. Kant
107. Hegel
108. Nineteenth-Century Philosophy
109. History of Analytic Philosophy
110. Wittgenstein
161. Topics in the History of Ethics
166. Classics in Political Philosophy
180. Phenomenology
181. Existentialism
182. Marx and Marxism
183. Topics in Continental Philosophy

Grade Rules for Majors/Minors

All courses applied toward the major or minor must be completed with a grade of C– or higher. Further, a GPA of 2.0 must be maintained in courses applied toward the major or minor. It should be noted that courses taken under the Pass/Not-Pass (P/NP) grading option cannot be applied toward the major or minor.

Honors Program

The philosophy department offers an honors program for outstanding students in the major. Majors who have a 3.7 GPA in philosophy (3.25 overall) at the end of their junior year and who have taken at least four upper-division philosophy courses are eligible to apply. Interested students must consult with a faculty sponsor by the last day of classes during the spring term of their junior year. Admission to the honors program requires nomination by a faculty sponsor and approval of the undergraduate adviser. Nominating Petitions can be obtained from the philosophy department.

In addition to the usual major requirements, an honors student is required to complete a senior honors thesis by the end of winter quarter. During the fall and winter quarters, the student will be registered for Philosophy 191 and 192 and will be engaged in thesis research that will be supervised and evaluated by the student's faculty sponsor. A departmental committee will read and assess the completed thesis and determine if philosophy honors are to be awarded. Honors students are expected to maintain an average of 3.7 or better for all work taken in the program. (Qualified students wishing to participate in the honors program according to a different timetable than the one described above can apply to do so by petitioning the undergraduate adviser.)

Transfer Credit

Courses taken at other institutions may be applied toward the major by petition only. Petitions should be submitted to the Department of Philosophy main office, and must be accompanied by supporting materials (transcripts, syllabi, course work, etc.). Students are required to submit one petition per transfer course.

For specific regulations regarding transfer credit for Philosophy 10 (Introduction to Logic), please see the information on the department Web site: http://philosophy.ucsd.edu.

It is important to note that seven of the twelve upper-division courses in the major must be taken in the Department of Philosophy at UCSD.

Note: All courses applied towards major must be taken for a letter grade.

Undergraduate Program—Minor

The Department of Philosophy offers a minor in philosophy. As with the major, the minor is an attractive option for a wide range of career paths, including medicine, law, research in the natural and social sciences, journalism, education, and government. A minor requires a total of seven philosophy courses, at least five of which must be upper division. If choosing an area of emphasis, at least four upper-division courses must be from the chosen area of emphasis. All courses must be taken for a letter grade, C– or better.

Advising Office

Students who desire additional information concerning our course offerings or program may contact individual faculty or the assistant director of the undergraduate program through the department main office at 7002 H&SS, (858) 534-3070.

Graduate Program Requirements

The department offers programs leading to the M.A. and Ph.D. It is the intention of the graduate program to enable the student to obtain an understanding of diverse traditions and to develop as a philosopher in his or her own right. To this end, the department offers courses and seminars in the history of philosophy and in traditional and contemporary philosophical issues, from a variety of perspectives.

Master's Degree Program

To qualify for a master's degree in philosophy, a student must pass eight of the distribution requirement seminars as described below, under the subheading "Distribution Requirements." At least one of the seminars must be from the ethics and political philosophy category, and no more than four seminars from any one of the five areas may count toward the master's degree. The student must also complete a master's research paper, under the direction of a faculty member or his or her choice, and have it approved by two members of the department faculty.

Although Ph.D. students sometimes elect to complete their studies with a master's degree, *we do not admit students to a master's degree program.*

Doctoral Degree Program

Course Work

During the first two years of residence the student's work will normally total thirty-six units (nine courses) per year. At least twelve of these units in each year must be graduate philosophy seminars (those numbered 201-285). The balance may be made up from additional graduate courses in philosophy, upper-division courses in philosophy (those numbered 100-199), approved upper-division or graduate courses in related departments, and, if the student is a teaching assistant, Philosophy 500 (Apprentice Teaching).

After consultation with the graduate adviser, each entering student shall be assigned a faculty adviser. Students are encouraged to meet with their faculty adviser periodically to plan their course of study during their first two years and must meet once a year in the spring to review progress in the program.

Logic Requirement

During the first term of residence, all entering graduate students will take an examination designed to demonstrate their level of proficiency in formal logic. The examination covers the predicate calculus, up to and including functions, relations, and identity. Students who pass the examination with a grade of B+ or better have satisfied the first component of the logic requirement. Students who do not score a B+ or better must take Philosophy 120 (Symbolic Logic) during the first year of study and achieve a grade of B+ or better. By the end of the sixth term of residence, all students must also pass an advanced logic course (Philosophy 121, 122, 221, or another logic class approved by the graduate adviser) with at least a grade of B+.

Proseminar

In fall quarter of their first year of residence, graduate students shall take a proseminar designed to introduce them to philosophical

methods and improve their skills at writing and analysis. Enrollment in the proseminar is limited to first-year students. The proseminar is normally team-taught. The topics to be covered will address some central area of areas of philosophy and will vary from year to year. The proseminar is a regular four-unit seminar and as such may be counted toward satisfaction of the distribution requirement.

Core Courses

In the following areas, the department shall offer "core" or advanced introductory seminars: philosophy of mind, philosophy of language, philosophy of science, the history of philosophy, epistemology, metaphysics, and ethics. The department shall offer at least three of these courses in each academic year. Students must take two of these core courses by the end of their sixth quarter of residence. Courses taken to satisfy this requirement may be applied toward the distribution requirement. (A *core course* provides a point of entry into a field that is suitable for graduate students with no prior work in this area of philosophy as well as students with some background knowledge. A core course need not be and normally should not be a general survey of the field, but will take up some central topic. A core course will normally offer students the option of writing shorter papers rather than one long seminar paper; as an alternative, a final examination may be offered.)

Distribution Requirements

By the end of the seventh quarter of residence, a student must have completed ten graduate seminars in philosophy with a grade of B+ or better. The seminars must be distributed as follows:

1. Four seminars in the history of philosophy. At least one of these courses must be in ancient philosophy; at least one must be in modern philosophy.
2. Six seminars in the four areas listed below. Students must take at least one seminar in every area and two seminars in any two of the areas.

A. Philosophy of science and philosophy of logic

B. Philosophy of mind and philosophy of language

C. Ethics and political philosophy

D. Metaphysics and epistemology

Courses used to satisfy a requirement in one category cannot be used to satisfy a requirement in another category. The determination as to what category or categories a particular seminar taught in a given quarter may count toward is normally made by the seminar instructor.

The proseminar and courses used to satisfy the core course requirement may be counted toward fulfillment of the distribution requirement.

At the end of the fifth quarter of residence, a student must have completed eight of the required seminars. In order to remain in the program, a student must have attained an average of B+ or better in all philosophy seminars completed by this point.

Philosophy Writing Workshop

In fall term of their third year of study, graduate students shall enroll in the Philosophy Writing Workshop, a one- to three- unit course depending on the expected enrollment. This course is graded on a Satisfactory/Unsatisfactory basis. In this workshop each student shall produce a polished original philosophical essay (this may be based on a paper written for a seminar), criticize the essays produced by other workshop participants, and present the essay as a talk to an audience of workshop participants, the faculty instructor, and other interested graduate students and faculty.

Independent Study Courses

Philosophy 290 (Directed Independent Study) is appropriate for a graduate student still in the process of fulfilling course requirements for the degree.

Philosophy 295 (Research Topics) is an appropriate course for a student in the process of coming up with a dissertation prospectus.

Philosophy 299 (Thesis Research) is appropriate for a student working on his or her dissertation.

Language Requirement

Before advancing to candidacy, all students must demonstrate reading proficiency in one of the following languages:

German
French
Latin
Classical Greek

If a student's chosen dissertation topic requires competence in a second language from the above list, then the student's dissertation adviser can require a suitable demonstration of competence. In special circumstances students may be permitted to substitute a different language or a special competency (such as advanced work in mathematics or in one of the sciences) if educationally compelling reasons can be given for doing so. These exceptions will be decided on a case-by-case basis. The language requirement must be met before the student can be advanced to candidacy.

Third-Year Advising

At the end of the student's sixth quarter of study, the department appoints a three-member faculty committee for that student. The composition of the committee will reflect the student's preferences and the area of philosophy in which the student is inclined to do dissertation work. The committee's task is to help the student to develop a sound dissertation project and advance to candidacy in a timely manner. There is no expectation that the members of this third-year committee necessarily will serve on the dissertation committee.

Dissertation Prospectus and Oral Candidacy Exam

Some time after completing the distribution requirements, the student must submit a dissertation prospectus to his or her doctoral committee. The committee will then orally examine the student on the intended subject and plan of research. The examination will seek to establish that the thesis proposed is a satisfactory subject of research and that the student has the preparation and the abilities necessary to complete that research. This oral qualifying exam must be passed before the end of the twelfth quarter of residence. Students who are passed and have met the other requirements will be advanced to candidacy for the Ph.D.

Teaching Requirements

Participation in undergraduate teaching is one of the requirements for a Ph.D. in philosophy. The student is required to serve as a teaching assistant for the equivalent of one-quarter time for three academic quarters. The duties of a teaching assistant normally entail grading papers and examinations, conducting discussion sections, and related activities, including attendance at lectures in the course for which he or she is assisting.

Doctoral Dissertation

Under the supervision of a doctoral committee, each candidate will write a dissertation demonstrating a capacity to engage in original and independent research. The candidate will defend the thesis in an oral examination by the doctoral committee. (See "Graduate Studies: The Doctor of Philosophy Degree.")

Application Request

For information regarding the graduate program call (858) 534-6809 or write to:
University of California, San Diego
Graduate Adviser; Philosophy, 0119
9500 Gilman Drive; La Jolla CA 92093-0119
Email: casmann@ucsd.edu

Interdisciplinary Degree Programs

The philosophy department at UCSD participates in two interdisciplinary programs, the requirements for which are outlined below.

Interdisciplinary Degree Program in Cognitive Science

The Interdisciplinary Ph.D. Program in Cognitive Science includes faculty from a number of UCSD departments including anthropology, biology and neurobiology, cognitive science, communication, computer science and engineering, linguistics, music, neurosciences, philosophy, psychiatry, psychology, and sociology. This group includes many outstanding figures in contemporary cognitive science.

Students wishing to pursue a Ph.D. in "Philosophy and Cognitive Science" register in the philosophy program in the normal fashion, but pursue a significant portion of their studies with faculty in the several departments participating in the interdisciplinary program. Students may apply for admission to the interdisciplinary program at the same time that they apply to the Department of Philosophy, or at some point after entering UCSD, (All students wishing to transfer into any interdisciplinary program must do so prior to the end of the fifth quarter of residency.)

Students in philosophy/cognitive science are required to do the following:

1. Complete all requirements for the philosophy Ph.D. except that the distribution requirement is amended. By the end of the ninth quarter of residence, a philosophy/cognitive science degree student must have completed ten graduate seminars in philosophy with a grade of B+ or better in each course distributed across the areas of (A) philosophy of science and philosophy of logic, (B) philosophy of mind and philosophy of language, (C) ethics and political philosophy, (D), epistemology and metaphysics, and (E) history of philosophy. Students must take at least one seminar from each of these five areas and at least two seminars form any four of these areas.
2. The equivalent of one year's course work (usually in six courses) in one or more of the other departments affiliated with the Department of Cognitive Science. (It should be noted that a philosophy graduate student who completes this requirement is deemed thereby to have satisfied the philosophy language requirement by gaining an approved special competency.)
3. Six quarters of Cognitive Science 200

A plan detailing the course of study must be approved by the Cognitive Science Program Committee. The dissertation should be interdisciplinary, reflecting the two areas of specialization.

Science Studies Program

The Science Studies Program at UCSD is committed to interdisciplinary investigations. Understanding, interpreting, and explaining the scientific enterprise demand a systematic integration of the perspectives developed within the history, sociology, and philosophy of science. The program offers students an opportunity to work towards such integration, while receiving a thorough training at the professional level in one of the component disciplines.

Students enrolled in the program choose one of the component disciplines for their major field of specialist studies, and are required to complete minor field requirements in the others. The core of the program, however, is a year-long seminar in science studies, led by faculty from all participating departments.

To obtain a Ph.D. in "Philosophy/Science Studies," students must take a total of eighteen courses, including:

1. Nine seminars in philosophy with a grade of B+ or better, distributed across the areas of (A) philosophy of science and philosophy of logic, (B) philosophy of mind and philosophy of language, (C) ethics and political philosophy, (D) metaphysics and epistemology, and (E) history of philosophy. Students must take at least one seminar from each of these five areas and at least two seminars from any three of these areas. This requirement must be completed by the end of the seventh quarter of residence. By the end of the fifth quarter of residence, a student must have taken at least five Philosophy seminars (distributed across at least three areas), and must have achieved an average B+ or better in all philosophy seminars taken up to that point. Failure to take a sufficient number of seminars or to achieve a B+ average means that the student may not continue in the program after the fifth quarter.
2. The Introduction to Science Studies 209A, plus the Seminar in Science Studies 209B, to be taken twice with changed content, plus Colloquium in Science Studies 209C, to be taken once on a Satisfactory/Unsatisfactory basis and once for a letter grade.
3. Two additional Science Studies courses outside philosophy drawn from a list of approved courses available each year from the Science Studies Program office. (One course in one of the sciences may be substituted for one of these courses as part of an approved program of study.)

The student's program of study must be approved by the philosophy faculty adviser for Science Studies.

Students may apply for admission to the interdisciplinary program at the same time that they apply to the Department of Philosophy, or at some point after entering UCSD. (All students wishing to transfer into any interdisciplinary program must do so prior to the end of the fifth quarter of residency.)

Ph.D. Time Limit Policies

Students must be advanced to candidacy by the end of four years. Total university support cannot exceed seven years. Total registered time at UCSD cannot exceed eight years.

Financial Aid

Almost all philosophy graduate students are supported by some form of financial aid. Most work as teaching assistants at 50 percent time (approximately $14,143 for nine months). Typically this involves running discussion sections and grading papers for lecture and introductory courses in philosophy, humanities, and writing

programs. An assistantship is also regarded as a full-credit course, so teaching assistants usually take two graduate classes each quarter.

In addition, some Regents' fellowships are available for first-year students, and the department usually awards one or more dissertation fellowships a year for its advanced graduate students. Various fee scholarships, tuition and tuition/fee scholarships are also available, as are San Diego fellowships.

Advanced graduate students who have just completed or nearly completed their dissertations are sometimes hired by the department as teaching associates or visiting lecturers. Under these titles advanced graduate students autonomously plan and teach their own courses.

COURSES

LOWER-DIVISION

1. The Nature of Philosophy (4)
What is philosophy? A study of major philosophical questions, making use of both classical and contemporary sources. An introduction to the basic methods and strategies of philosophical inquiry.

10. Introduction to Logic (4)
Basic concepts and techniques in both informal and formal logic and reasoning, including a discussion of argument, inference, proof, and common fallacies, and an introduction to the syntax, semantics, and proof method in sentential (propositional) logic. (May be used to fulfill general-education requirements for Warren and Eleanor Roosevelt Colleges.)

12. Logic and Decision Making (4)
An introduction to the study of probability, inductive logic, scientific reasoning, and rational choice among competing hypotheses and alternative courses of action when the evidence is incomplete or uncertain. (May be used to fulfill general-education requirements for Marshall, Warren, and Eleanor Roosevelt Colleges.)

13. Introduction to Philosophy: Ethics (4)
An inquiry into the nature of morality and its role in personal or social life by way of classical and/or contemporary works in ethics. (May be used to fulfill general-education requirements for Muir and Marshall Colleges.)

14. Introduction to Philosophy: Metaphysics (4)
A survey of central issues and figures in the Western metaphysical tradition. Topics include the mind-body problem, freedom and determinism, personal identity, appearance and reality, and the existence of God. (May be used to fulfill general-education requirements for Muir and Marshall Colleges.)

15. Introduction to Philosophy: Theory of Knowledge (4)
A study of the grounds and scope of human knowledge, both commonsense and scientific, as portrayed in the competing traditions of Continental rationalism, British empiricism, and contemporary cognitive science. (May be used to fulfill general-education requirements for Muir and Marshall Colleges.)

27. Ethics and Society (4)
(Same as Political Science 27) An inquiry into the principles of ethical conduct and their applications. The course examines some of the major theories (including natural law, individual rights, utilitarianism) and the general issue of rights and obligations with respect to adherence to law (as in civil disobedience abortion and the refusal to obey an unjust law or order). Case studies will be employed to consider the relevance of these principles to various occupations such as business, engineering, law and government, in order to enable students to anticipate some of the difficulties that will arise for them in real-life situations whenever hard moral choices must be made. Satisfies the Warren College ethics and society requirement. This course is required for all Warren students entering the college in fall 1985 and thereafter.

31. History of Philosophy: Ancient Philosophy (4)
A survey of classical Greek philosophy with an emphasis on Socrates, Plato and Aristotle, though some consideration may be given to Presocratic and/or Hellenistic philosophers. (May be used in fulfilling the Muir College breadth requirement.)

32. History of Philosophy: The Origins of Modern Philosophy (4)
A survey of early modern philosophy. Beginning with the contrast between medieval and modern thought, the course focuses on modern philosophy and its relation to the scientific revolution of the sixteenth and seventeenth centuries. Philosophers to be studied include Descartes, Hobbes, Spinoza, and Leibniz. (May be used in fulfilling the Muir College breadth requirement.)

33. History of Philosophy: Philosophy in the Age of Enlightenment (4)
A survey of the major philosophers of the late seventeenth and eighteenth centuries with a focus on the British empiricists—Locke, Berkeley, and Hume—and the critical philosophy of Kant. (May be used in fulfilling the Muir College Breadth requirement.)

UPPER-DIVISION

100. Plato (4)
A study of Socrates and/or Plato through major dialogues of Plato. Possible topics include the virtues and happiness; weakness of the will; political authority and democracy; the theory of Forms and sensible flux; immortality; relativism, skepticism, and knowledge. May be repeated for credit with change of content and approval of instructor. *Prerequisite: upper-division standing or consent of instructor.*

101. Aristotle (4)
A study of major issues in Aristotle's works, such as the categories; form and matter; substance, essence, and accident; the soul; virtue, happiness, and politics. *Prerequisite: upper-division standing or consent of instructor.*

102. Hellenistic Philosophy (4)
A study of selected texts from the main schools of Hellenistic philosophy—Stoicism, Epicureanism, and Skepticism. *Prerequisite: upper-division standing or consent of instructor.*

104. The Rationalists (4)
The major writings of one or more of the seventeenth century rationalists—Descartes, Spinoza, and Leibniz. Topics include the existence of God, the mind-body problem, free will, the nature of knowledge, belief, and error. May be repeated for credit with change of content and approval of instructor. *Prerequisite: upper-division standing or consent of instructor.*

105. The Empiricists (4)
The major writings of one or more of the British empiricists—Locke, Berkeley, Hume, and Reid. May be repeated for credit with change of content and approval of instructor. *Prerequisite: upper-division standing or consent of instructor.*

106. Kant (4)
A study of selected portions of the Critique of Pure Reason and other theoretical writings and/or his major works in moral theory. *Prerequisite: Philosophy 33 or 105 or consent of instructor.* May be repeated for credit with change in content and approval of the instructor.

107. Hegel (4)
A study of one or more of Hegel's major works, in particular, *The Phenomenology of Spirit* and *The Philosophy of Right.* Readings and discussion may also include other figures in the Idealist tradition—such as Fichte, Hölderlin, and Schelling—and critics of the Idealist tradition—such as Marx and Kierkegaard. *Prerequisite: upper-division standing or consent of instructor.*

108. Nineteenth-Century Philosophy (4)
A study of one or more figures in nineteenth-century philosophy, such as Schopenhauer, Nietzsche, Kierkegaard, Marx, Emerson, Thoreau, James, and Mill. The focus may be on particular figures or intellectual themes and traditions. May be repeated for credit with change of content and approval of instructor. *Prerequisite: upper-division standing or consent of instructor.*

109. History of Analytic Philosophy (4)
Central texts, figures, and traditions in analytic philosophy. Figures may include Frege, Russell, Wittgenstein, Carnap, Moore, Austin, Tarski, Quine, Davidson, Kripke, and Putnam. May be repeated for credit with change of content and approval of instructor. *Prerequisite: Philosophy 120 or consent of instructor.*

110. Wittgenstein (4)
Central themes and writings in the philosophy of Ludwig Wittgenstein. Topics include the nature of logic and philosophy, solipsism, the private language argument, certainty, meaning, and rule-following. Readings include *Tractatus Logico-Philosophicus, Philosophical Investigations,* and *On Certainty. Prerequisite: upper-division standing or consent of instructor.*

111. Contemporary Work in Epistemology and Metaphysics (4)
A study of a prominent figure or central issue in contemporary epistemology and/or metaphysics. Examples of figures: Quine, Putnam, Sellars; examples of issues: the problem of universals, the nature of self-knowledge, freedom, ontological relativity. May be repeated for credit with change of content and approval of instructor. *Prerequisite: upper-division standing or consent of instructor.*

115. Philosophical Methods Seminar (4)
This course provides an introduction to the techniques of philosophical inquiry through detailed study of selected philosophical texts and through extensive training in philosophical writing based on those texts. Enrollment limited and restricted to majors; must be taken for letter grade. May not be repeated for credit. *Prerequisite: open to philosophy majors only.*

120. Symbolic Logic I (4)
The syntax, semantics, and proof-theory of first-order predicate logic with identity, emphasizing both conceptual issues and practical skills (e.g., criteria for logical truth, consistency, and validity, the application of logical methods to everyday as well as scientific reasoning). *Prerequisite: Philosophy 10 or consent of instructor.*

121. Symbolic Logic II (4)
The meta-theory of first-order predicate logic: expressive power, the notions of a model, truth-in-a-model, effective procedure, proof and decidability, the completeness of first-order logic (co-extensionality of the semantic and proof-theoretic methods), etc. The course is fairly formal. *Prerequisite: Philosophy 120 or consent of instructor.*

122. Topics in Logic (4)
A study of new, extended, or alternative logics and/or special issues in meta-logic. Topics include the nature of logic, modal logic, higher-order logic, generalized logic, free logic, the Skolem-Lπwenheim theorem, the incompleteness of arithmetic, undecidability. May be repeated for credit with change in content and approval of instructor. *Prerequisite: Philosophy 120 (and for advanced topics: Philosophy 121) or consent of instructor.*

123. Philosophy of Logic (4)
Philosophical issues underlying standard and nonstandard logics, the nature of logical knowledge, the relation between logic and mathematics, the revisability of logic, truth and logic, ontological commitment and ontological relativity, logical consequence, etc. May be repeated for credit with change in content and approval of instructor. *Prerequisite: Philosophy 120 or consent of instructor.*

125. Games and Decisions (4)
Formal and philosophical issues in the theory of games and the theory of rational decision. *Prerequisite: Philosophy 12 or consent of instructor.*

130. Metaphysics (4)
Central problems in metaphysics, such as free will and determinism, the mind-body problem, personal identity, causation, primary and secondary qualities, the nature of universals, necessity, and identity. *Prerequisite: upper-division standing or consent of instructor.*

131. Topics in Metaphysics (4)
An in-depth study of some central problem, figure, or tradition in metaphysics. May be repeated for credit with change of content and approval of instructor. *Prerequisite: upper-division standing or consent of instructor.*

132. Epistemology (4)
Central problems in epistemology such as skepticism; a priori knowledge; knowledge of other minds; self-knowledge; the problem of induction; foundationalist, coherence, and causal theories of knowledge. *Prerequisite: upper-division standing or consent of instructor.*

134. Philosophy of Language (4)
Examination of contemporary debates about meaning, reference, truth, and thought. Topics include descriptional theories of reference, sense and reference, compositionality, truth, theories of meaning, vagueness, metaphor, and natural and formal languages. *Prerequisite: upper-division standing or consent of instructor.*

136. Philosophy of Mind (4)
Different conceptions of the nature of mind and its relation to the physical world. Topics include identity theories, functionalism, eliminative materialism, internalism and externalism, subjectivity, other minds, consciousness, self-knowledge, perception, memory, and imagination. *Prerequisite: upper-division standing or consent of instructor.*

137. Philosophy of Action (4)
The nature of action and psychological explanation. Topics include action individuation, reasons as causes, psychological laws, freedom and responsibility, weakness of will, self-deception, and the emotions.

138. Consciousness (4)
Philosophical issues about consciousness, such as multiple or split consciousness, altered consciousness, perspectives and points of view, neuroscientific and cognitive theories, animal, machine, and social consciousness, the evolution of consciousness, zombies. *Prerequisite: upper-division standing or consent of instructor.*

139. The Nature of Representation (4)
A philosophical grounding in concepts and distinctions that govern the use of representations in various media, such as analog/digital, implicit/explicit, imagistic/propositional, indexical/descriptive, medium/message, distributed/local, symbolic/associative, situated/context-independent, and opaque/transparent. *Prerequisite: upper-division standing or consent of instructor.*

145. Philosophy of Science (4)
Central problems in philosophy of science, such as the nature of confirmation and explanation, the nature of scientific revolutions and progress, the unity of science, and realism and antirealism. *Prerequisite: upper-division standing or consent of instructor.*

146. Philosophy of Physics (4)
Philosophical problems in the development of modern physics, such as the philosophy of space and time, the epistemology of geometry, the philosophical significance of Einstein's theory of relativity, the interpretation of quantum mechanics, and the significance of modern cosmology. *Prerequisite: upper-division standing or consent of instructor.*

147. Philosophy of Biology (4)
Philosophical problems in the biological sciences, such as the relation between biology and the physical sciences, the status and structure of evolutionary theory, and the role of biology in the social sciences. *Prerequisite: upper-division standing or consent of instructor.*

148. Philosophy and the Environment (4)
Investigation of ethical and epistemological questions concerning our relationship to the environment. Topics may include the value of nature, biodiversity, policy and science, and responsibility to future generations. *Prerequisite: upper-division standing or consent of instructor.*

149. Philosophy of Psychology (4)
Philosophical issues raised by psychology, including the nature of psychological explanation, the role of nature versus nurture, free will and determinism, and the unity of the person. *Prerequisite: upper-division standing or consent of instructor.*

150. Philosophy of the Cognitive Sciences (4)
Theoretical, empirical, methodological, and philosophical issues at work in the cognitive sciences (e.g., Psychology, Linguistics, Neuroscience, Artificial Intelligence, and Computer Science), concerning things such as mental representation, consciousness, rationality, explanation, and nativism. *Prerequisite: upper-division standing or consent of instructor.*

151. Philosophy of Neuroscience (4)
An introduction to elementary neuroanatomy and neurophysiology and an examination of theoretical issues in cognitive neuroscience and their implications for traditional philosophical conceptions of the relation between mind and body, perception, consciousness, understanding, emotion, and the self. *Prerequisite: upper-division standing or consent of instructor.*

152. Philosophy of Social Science (4)
Philosophical issues of method and substance in the social sciences, such as causal and interpretive models of explanation, structuralism and methodological individualism, value neutrality, and relativism. *Prerequisite: upper-division standing or consent of instructor.*

153. Philosophy of History (4)
A study of classical and/or contemporary conceptions of history and historical knowledge. Topics may include the structure of historical explanation, historical progress, objectivity in historiography, hermeneutics and the human sciences. *Prerequisite: upper-division standing or consent of instructor.*

160. Ethical Theory (4)
Systematic and/or historical perspectives on central issues in ethical theory such as deontic, contractualist, and consequentialist conceptions of morality; rights and special obligations; the role of happiness and virtue in morality; moral conflict; ethical objectivity and relativism; and the rational authority of morality. *Prerequisite: upper-division standing or consent of instructor.*

161. Topics in the History of Ethics (4)
Central issues and texts in the history of ethics. Subject matter can vary, ranging from one philosopher (e.g., Aristotle, Hobbes, Kant, or Mill) to a historical tradition (e.g., Greek ethics or the British moralists). May be repeated for credit with change in content and approval of instructor. *Prerequisite: upper-division standing or consent of instructor.*

162. Contemporary Moral Issues (4)
An examination of contemporary moral issues, such as abortion, euthanasia, war, affirmative action, and freedom of speech. *Prerequisite: upper-division standing or consent of instructor.*

163. Biomedical Ethics (4)
Moral issues in medicine and the biological sciences, such as patient's rights and physician's responsibilities, abortion and euthanasia, the distribution of health care, experimentation, and genetic intervention. *Prerequisite: upper-division standing or consent of instructor.*

164. Technology and Human Values (4)
Philosophical issues involved in the development of modern science, the growth of technology, and control of the natural environment. The interaction of science and technology with human nature and political and moral ideals. *Prerequisite: upper-division standing or consent of instructor.*

166. Classics in Political Philosophy (4)
Central issues about the justification, proper functions, and limits of the state through classic texts in the history of political philosophy by figures such as Plato, Aristotle, Hobbes, Locke, Rousseau, Mill, and Marx. *Prerequisite: upper-division standing or consent of instructor.*

167. Contemporary Political Philosophy (4)
Different perspectives on central issues in contemporary political philosophy, such as the nature of state authority and political obligation, the limits of government and individual liberty, liberalism and its critics,

equality and distributive justice. *Prerequisite: upper-division standing or consent of instructor.*

168. Philosophy of Law (4)
A study of issues in analytical jurisprudence such as the nature of law, the relation between law and morality, and the nature of legal interpretation and issues in normative jurisprudence such as the justification of punishment, paternalism and privacy, freedom of expression, and affirmative action. *Prerequisite: upper-division standing or consent of instructor.*

169. Feminism and Philosophy (4)
Examination of feminist critiques of, and alternatives to, traditional philosophical conceptions of such things as morality, politics, knowledge, and science. *Prerequisite: upper-division standing or consent of instructor.*

170. Philosophy and Race (4)
A philosophical investigation of the topics of race and racism. The role of "race" in ordinary speech. The ethics of racial discourse. Anthropological and biological conceptions of race. The social and political significance of racial categories. Post-racialist conceptions of race.

175. Aesthetics (4)
Central issues in philosophical aesthetics such as the nature of art and aesthetic experience, the grounds of artistic interpretation and evaluation, artistic representation, and the role of the arts in education, culture, and politics. *Prerequisite: upper-division standing or consent of instructor.*

177. Philosophy and Literature (4)
A study of philosophical themes contained in selected fiction, drama, or poetry, and the philosophical issues that arise in the interpretation, appreciation, and criticism of literature. *Prerequisite: upper-division standing or consent of instructor.*

180. Phenomenology (4)
An examination of the phenomenological tradition through the works of its major classical and/or contemporary representatives. Authors studied will vary and may include Brentano, Husserl, Heidegger, Merleau-Ponty, Levinas, Bourdieu. *Prerequisite: upper-division standing or consent of instructor.*

181. Existentialism (4)
Classical texts and issues of existentialism. Authors studied will vary and may include Nietzsche, Kierkegaard, Sartre, and Heidegger. *Prerequisite: upper-division standing or consent of instructor.*

182. Marx and Marxism (4)
Central issues in the writings of the early and late Marx, such as alienation, false consciousness, exploitation, historical materialism, the critique of capitalism, and communism. Attention may be given to Marx's philosophical predecessors (e.g., Smith, Rousseau, Hegel, Feuerbach) and/or to subsequent developments in Marxism (e.g., the Frankfurt school and analytical Marxism). *Prerequisite: upper-division standing or consent of instructor.* Not offered in 2004-2005.

183. Topics in Continental Philosophy (4)
The focus will be on a leading movement in continental philosophy (e.g., the critical theory of the Frankfurt school, structuralism and deconstruction, post-modernism) or some particular issue that has figured in these traditions (e.g., freedom, subjectivity, historicity, authenticity). May be repeated for credit with change in content and approval of instructor. *Prerequisite: upper-division standing or consent of instructor.*

185. Philosophy of Religion (4)
A general introduction to the philosophy of religion through the study of classical and/or contemporary texts. Among the issues to be discussed are the existence and nature of God, the problem of evil, the existence of miracles, the relation between reason and revelation, and the nature of religious language. *Prerequisite: upper-division standing or consent of instructor.*

190. Special Topics (4)
A special philosophical topic. May be repeated for credit with change of content and approval of instructor. *Prerequisite: upper-division standing or consent of instructor.*

191. Philosophy Honors (4)
Independent study by special arrangement with and under the supervision of a faculty member, including a proposal for the honors essay. An IP grade will be awarded at the end of this quarter; a final grade will be given for both quarters at the end of 192. *Prerequisites: department stamp; consent of instructor.*

192. The Honors Essay (4)
Continuation of 191: independent study by special arrangement with and under the supervision of a faculty member, leading to the completion of the honors essay. A letter grade for both 191 and 192 will be given at the end of this quarter. *Prerequisite: consent of instructor.*

199. Directed Individual Study (4)
Directed individual study by special arrangement with and under the supervision of a faculty member. (P/NP grades only.) *Prerequisite: consent of instructor.*

GRADUATE COURSES

200. Proseminar (4)
Introduction to philosophical methods of analysis through study of classic historical or contemporary texts. Writing intensive. Enrollment limited to entering graduate students.

201A. Core Course in History (4)
A study of selected texts or topics in the history of philosophy. Usually the focus will be on a single major text. May be taken for credit nine times with changed content.

202. Core Course in Ethics (4)
An introduction to some central issues in ethical theory with emphasis on classic texts or contemporary authors. May be taken for credit three times with changed content.

203. Core Course in Political Philosophy (4)
A study of central topics concerning the nature, justification, and limits of state authority. The emphasis may be on classic texts or contemporary writings. May be taken for credit three times with changed content.

204A. Core Course in Philosophy of Science (4)
An introduction to one or more central problems in the philosophy of science, or in the philosophy of one of the particular sciences, such as the nature of confirmation and explanation, the nature of scientific knowledge, reductionism, the unity of science, or realism and antirealism. May be taken for credit three times with changed content.

205A. Core Course in Metaphysics (4)
An introduction to central topics in metaphysics with emphasis on classic texts or contemporary authors. May be taken for credit three times with changed content.

206A. Core Course in Epistemology (4)
An introduction to central topics in epistemology with emphasis on classic texts or contemporary authors. May be taken for credit three times with changed content.

209A. Introduction to Science Studies (4)
Study and discussion of classic work in history of science, and philosophy of science, and of work that attempts to develop a unified science studies approach. Required of all students in the Science Studies Program.

209B. Seminar in Science Studies (4)
Study and discussion of selected topics in the science studies field. Required of all students in the Science Studies Program. The topic varies from year to year and students may, therefore, repeat the course for credit. May be taken for credit three times with changed content.

209C. Colloquium in Science Studies (4)
A forum for the presentation and discussion of research in progress in science studies, by graduate students, faculty, and visitors. May be taken for credit two times with changed content.

210. Greek Philosophy (4)
A study of selected texts or topics from the history of Greek philosophy. Usually centers on works by Plato or Aristotle. May be taken for credit six times with changed content.

214. Early Modern Philosophy (4)
A study of selected texts or topics from philosophers of the sixteenth and seventeenth centuries, Descartes, Spinoza, Leibniz, or Locke. May be taken for credit six times with changed content.

215. Eighteenth-Century Philosophy (4)
A study of selected texts or topics from philosophers of the eighteenth century: for example, Kant or Hume. May be taken for credit six times with changed content.

216. Nineteenth-Century Philosophy (4)
A selective study of major philosophical texts for the period, with emphasis on such figures as Hegel, Marx, Nietzsche, Mill, and others. May be taken for credit six times with changed content.

217. Twentieth-Century European Philosophy (4)
A study of selected topics in twentieth-century European philosophy as reflected in the major writings of Husserl, Heidegger, Sartre, Merleau-Ponty, and others. May be taken for credit six times with changed content.

218. Contemporary Analytical Philosophy (4)
A study of the historical development of the analytical movement, with emphasis on major texts. May be taken for credit six times with changed content.

221. Advanced Symbolic Logic (4)
Topics in mathematical logic and set theory, metatheory, nonstandard logics, and other contemporary developments in logical theory. May be taken for credit five times with changed content.

222. Philosophy of Logic (4)
A study of selected issues in the philosophy of logic. The focus may be on contemporary texts or historical works or both. May be taken for credit six times with changed content.

230. Metaphysics (4)
Topics may include identity, personal identity, universals and particulars, modality and possible worlds, causa-

tion, reduction, supervenience, freedom and determinism, space and time, and realism versus antirealism. May be taken for credit six times with changed content.

232. Epistemology (4)
This seminar will cover issues such as rival accounts of knowledge, justification, and warrant, traditional and contemporary perspectives on empiricism, rationalism, and pragmatism, and skepticism. May be taken for credit six times with changed content.

234. Philosophy of Language (4)
Central issues in contemporary philosophy of language, such as the nature of linguistic meaning, truth, content, reference, the syntax and semantics of various linguistic constructions, presupposition, speech acts, the epistemology of language understanding and language learning, the mental/psychological basis of linguistic understanding and use. May be taken for credit six times with changed content.

236. Philosophy of Mind (4)
Contemporary debates on the nature, function, and operation of the mental. May include questions about the mind-body relation, mental causation, perception, consciousness, and mental representation. May be taken for credit six times with changed content.

245. Philosophy of Science (4)
This seminar will cover current books and theoretical issues in the philosophy of science. May be taken for credit seven times with changed content.

247. Philosophy of Biology (4)
Historical and contemporary perspectives on foundational issues about biology. May include questions about the nature of biological explanation, the relation of biology to chemistry and physics, the status of attributions of function, and the relation of biology to the social sciences. May be taken for credit six times with changed content.

250A. Philosophy of the Cognitive Sciences (4)
Contemporary debates about the study of the mind-brain as studied in one or more of the empirical cognitive sciences. May include questions about the different strategies of explanation invoked, the conceptions of representation employed, the connections between theoretical models developed. May be taken for credit six times with changed content.

260. Ethics (4)
Topics may include metaethics (e.g., the semantics, metaphysics, epistemology, and normativity of ethics), consequentialism and deontology, moral psychology (e.g., freedom, responsibility, and weaknesses of will), or substantive moral problems. The approach may be systematic, historical, or both. May be taken for credit six times with changed content.

267. Political Philosophy (4)
Topics may include the nature and limits of state authority, liberty and equality, distributive justice, liberalism and its critics (e.g., feminists, libertarians, and others), or issues in jurisprudence. The focus may be on classic texts or contemporary authors. May be taken for credit six times with changed content.

275. Aesthetics (4)
An exploration of problems in the philosophy of art, aesthetic experience, and aesthetic judgment within the context of a critical survey of some current aesthetic theories, and their illustrative application in various fields of art. May be taken for credit six times with changed content.

276. German Translation Workshop (1)
This course meets weekly to provide training in reading and translating philosophical German. Students prepare in advance written translations of assigned passages. The course helps train graduate students preparing to take the Departmental German Exam. Can be taken nine times for credit with changed content.

277. Phenomenology Reading Group (1-2)
This course meets biweekly with students reading and presenting material from the phenomenological literature. The course is designed both for students doing active research in phenomenology and for those seeking to gain some familiarity with that tradition. Can be taken nine times for credit with changed content.

278. Topics and Methods in Contemporary Philosophy (1-2)
Investigation of central issues in contemporary philosophy. Content varies but typically will center on a recent and important philosophical book. Can be taken nine times for credit with changed content.

279. Experimental Philosophy Laboratory (2)
A weekly forum of presentations, EPL provides a wider range of content than a traditional seminar. Content varies, but the focus is on philosophical problems of mind, representation, language and consciousness through empirical and philosophical methods. Can be taken nine times for credit with changed content.

280. Philosophy of Science Topics and Methods (1-2)
This course meets weekly to discuss recent books or articles in philosophy of science. The reading is designed both for students doing active research in the field and for those seeking to gain some familiarity with it. Can be taken nine times for credit with changed content.

281. History of Philosophy Research and Methods (1-2)
This course meets to discuss work in progress in the history of philosophy. Its aim is to introduce understanding of the methods and standards of research in the field through constructive criticism of each other's work. Can be taken nine times for credit with changed content.

282. Topics and Methods in Ethics (1-2)
Weekly or biweekly meetings to discuss recent literature in ethics, broadly construed so as to include ethical theory, normative ethics, jurisprudence, and historical traditions in these fields. The course is suitable for those specializing in ethics and for those seeking some familiarity with the field. Can be taken nine times for credit with changed content.

283. Topics and Methods in Political Philosophy (1-2)
Weekly or biweekly meetings to discuss recent literature in political philosophy and historical tradition of this field. The course is suitable for those specializing in ethics and for those seeking some familiarity with the field.

285. Seminar on Special Topics (4)
Focussed examination of specific problems or themes in some area of philosophy. May be taken for credit nine times with changed content.

290. Directed Independent Study (4)
Supervised study of individually selected philosophical topics. S/U grades permitted.

292. Writing Workshop (1-3)
Each enrolled student produces a research essay ready for publication, presents it to students and faculty, and offers critiques of other students' presentations. Units will vary according to enrollment in course. To be taken in fall quarter of third year of philosophy graduate study.

295. Research Topics (1-12)
Advanced individual research studies under the direction of a member of the staff. Hours of outside prep.will vary with number of units taken. May be taken for credit nine times with changed content.

299. Thesis Research (1-12)
S/U grades permitted.

500. Apprentice Teaching (1-4)
A course designed to satisfy the requirement that graduate students should serve as teaching assistants, either in the Department of Philosophy or in one of the writing programs offered by the various colleges. Each Ph.D. candidate must teach the equivalent of quarter time for three academic quarters. Students are permitted to sign up as TAs for a maximum of eighteen quarters.

Physics

OFFICES:

General Administration:
1110-113 Urey Hall Addition, Revelle College

Graduate Student Affairs:
1110-121 Urey Hall Addition

Undergraduate Student Affairs:
1110-115 Urey Hall Addition

Chair's Office: 1110-113 Urey Hall Addition
Web site: http://physics.ucsd.edu

Professors

Henry D. I. Abarbanel, Ph.D., *Director, Institute for Nonlinear Science*
Daniel P. Arovas, Ph.D., *Vice Chair for Education*
Dmitri N. Bassov, Ph.D.
Ami E. Berkowitz, Ph.D., *Research Professor*
James G. Branson, Ph.D.
Keith A. Brueckner, Ph.D., *Emeritus*
E. Margaret Burbidge, Ph.D., *Emeritus and Research Professor*
Geoffrey R. Burbidge, Ph.D., *Research Professor*
Leonid V. Butov, Ph.D.
Joseph C. Y. Chen, Ph.D.
Patrick H. Diamond, Ph.D.
C. Fred Driscoll, Ph.D.
Daniel H. E. Dubin, Ph.D.
Robert C. Dynes, Ph.D., *UC President*
George Feher, Ph.D., *Research Professor*
Zachary Fisk, Ph.D., *Emeritus*
Donald R. Fredkin, Ph.D.

George M. Fuller, Ph.D.
Marvin L. Goldberger, Ph.D., *Emeritus*
John M. Goodkind, Ph.D., *Chair*
Robert J. Gould, Ph.D., *Research Professor*
Kim Griest, Ph.D., *Chancellor's Associates Faculty Award for Excellence in Undergraduate Teaching, 2002*
Benjamin Grinstein, Ph.D.
Frances Hellman, Ph.D.
Jorge E. Hirsch, Ph.D.
Terence T-L. Hwa, Ph.D.
Kenneth A. Intriligator, Ph.D.
Elizabeth Jenkins, Ph.D.
Barbara Jones, Ph.D., *Academic Senate Distinguished Teaching Award*
David Kleinfeld, Ph.D.
Norman M. Kroll, Ph.D., *Research Professor*
Julius G. Kuti, Ph.D.
Herbert Levine, Ph.D.
Leonard N. Liebermann, Ph.D., *Emeritus*
Ralph H. Lovberg, Ph.D., *Emeritus*
David B. MacFarlane, Ph.D.
Aneesh V. Manohar, Ph.D.
M. Brian Maple, Ph.D., *Bernd T. Matthias Endowed Chair, Director, Institute for Pure and Applied Physical Sciences; Director, Center for Interface and Materials Science*
George E. Masek, Ph.D., *Emeritus*
Carl E. McIlwain, Ph.D., *Research Professor*
Xuong Nguyen-Huu, Ph.D., *Emeritus*
Michael L. Norman, Ph.D.
Melvin Y. Okamura, Ph.D.
Thomas M. O'Neil, Ph.D.
José N. Onuchic, Ph.D., *Academic Senate Distinguished Teaching Award*
Hans P. Paar, Ph.D.
Laurence E. Peterson, Ph.D., *Research Professor*
Sally K. Ride, Ph.D., *Ingrid and Joseph W. Hibben Endowed Chair*
Ivan K. Schuller, Ph.D.
Sheldon Schultz, Ph.D., *Research Professor*
Lu J. Sham, Ph.D.
Vitali D. Shapiro, Ph.D.
Vivek A. Sharma, Ph.D., *Academic Senate Distinguished Teaching Award, 2004*
Sunil K. Sinha, Ph.D.
Harding E. Smith, Ph.D.
Harry Suhl, Ph.D., *Research Professor*
Clifford M. Surko, Ph.D.
Robert A. Swanson, Ph.D., *Emeritus*
Harold Ticho, Ph.D., *Emeritus*
David R. Tytler, Ph.D.
Wayne Vernon, Ph.D., *Research Professor*
Arthur M. Wolfe, Ph.D., *Director, Center for Astrophysics and Space Sciences, Chancellor's Associates Chair*
Peter S. Wolynes, Ph.D.
David Y. Wong, Ph.D., *Emeritus*
Herbert F. York, Ph.D., *Emeritus*

Associate Professors

Massimiliano DiVentra, Ph.D.
Frank Wuerthwein, Ph.D.

Assistant Professors

Michael M. Fogler, Ph.D.
Alexander Groisman, Ph.D.
Brian G. Keating, Ph.D.
Paolo Padoan, Ph.D.
Douglas E. Smith, Ph.D.
Thomas W. Murphy, Jr., Ph.D.

Adjunct Professors

Hans Kobrak, Ph.D., *Emeritus*
Ferenc Mezei, Ph.D.
Tihiro Ohkawa, Ph.D.
Raj K. Pathria, Ph.D.
Ronald E. Waltz, Ph.D.

Associate Adjunct Professor

David R. Smith, Ph.D., *Associate Research Scientist*

Senior Lecturers

Richard E. Rothschild, Ph.D., *Research Scientist, Center for Astrophysics and Space Science*

The Department of Physics was established in 1960 as the first new department of the UCSD campus. Since then it has developed a strong faculty and student body with unusually diversified interests which lie primarily in the following areas:

1. Physics of elementary particles
2. Quantum liquids and superconductivity
3. Solid state and statistical physics
4. Plasma physics
5. Astrophysics and space physics
6. Atomic and molecular collision and structure
7. Biophysics
8. Geophysics
9. Nonlinear dynamics
10. Computational physics

In addition to on-campus research facilities, the high energy program uses accelerators at SLAC, CERN, and Fermi Laboratory. The astrophysics program uses facilities at Keck, Lick, and Kitt Peak Observatories.

The Undergraduate Program

The Department of Physics offers undergraduate programs leading to the following degrees:

B.S., Physics
B.S., Physics with Specialization in Astrophysics
B.S., Physics with Specialization in Biophysics
B.S., Physics with Specialization in Computational Physics
B.S., Physics with Specialization in Earth Sciences
B.S., Physics with Specialization in Materials Physics
B.A., General Physics
B.A., General Physics/Secondary Education

A grade-point average of 2.0 or higher in the upper-division major program is required for graduation. Students must receive a grade of C– or better in any course to be counted toward fulfillment of the major requirements. In exceptional cases, students with a grade-point average in the major of 2.5 or greater may petition to have one grade of D accepted. All courses (lower- and upper-division) required for the major must be taken for a letter grade.

Shang-keng Ma Award

The Department of Physics presents the Shang-keng Ma Memorial Award at commencement each year to a graduating physics student who has shown exceptional ability and promise during the UCSD undergraduate years. The award was established in 1984 to commemorate the contributions of Professor Ma to the UCSD Department of Physics and to the field of theoretical condensed matter physics.

John Holmes Malmberg Prize

The John Holmes Malmberg Prize is presented annually at commencement to a graduating physics student who is recognized for potential for a career in physics and a measure of experimental inquisitiveness. This prize was established in 1993 in memory of Professor Malmberg who pioneered the use of non-neutral plasmas for sophisticated tests of plasma equilibrium, wave,

and transport effects. He was an involved teacher of undergraduate and graduate students and was active in departmental and campus affairs.

Physics Major (B.S. Degree)

The physics major provides a core of basic education in several principle areas of physics, with sufficient flexibility to allow students to prepare either for graduate school or a career in industry. Since in preparing for either goal, more than the required core courses are necessary, it is important for students to meet with a physics department adviser in deciding a schedule.

In the junior year, the emphasis is on macroscopic physics; the two principal physics subjects are electromagnetism and mechanics. The mathematics and computer background required for the physics program is completed in this year.

In the senior year, a sequence of courses in quantum physics provides the student the modern view of atomic and some aspects of subatomic physics and the principal analytical methods appropriate in this domain. The relation of the microscopic to the macroscopic world is the subject of courses in thermodynamics and statistical physics, with illustrations drawn from gas dynamics and solid-state physics. Upper-division laboratories teach students the essentials of physical measurement and building advanced equipment, as well as other aspects of experimental science.

The following courses are required for the physics major:

Lower-Division

1. Physics 4A-B-C-D-E or Physics 2A-B-C-D[1]
2. Physics 2CL and 2DL
3. Chemistry 6A or[2] a programming course such as MAE 9 or MAE 10
4. Mathematics 20C-D-E-F

[1] The Physics 4 series is recommended, but the Physics 2 sequence is acceptable by petition, in which case both

[2] Chemistry 6A and a programming course are required

Upper-Division

1. Physics 100A-B, 105A, 110A, 120A, 130A-B, 140A, and an additional laboratory course from the lab group: 120B, 121, 133, 173
2. Two courses from either the theoretical or experimental pre-grad-school sequence

   Theoretical pre-grad-school sequence: Phys. 100C, 105B, 110B, 130C, 140B

   Experimental pre-grad-school sequence: Phys. 100C, 110B, 120B, 130C, 140B
3. Restricted electives: Three upper-division (four-unit) or graduate courses in physics or mathematics (only one). Courses in other science disciplines may be substituted by petition.

For students wishing to prepare for graduate school it is important that all courses in either the theorist or experimentalist pre-grad-school sequence be taken. Mathematics 120A is also recommended.

Suggested Schedule (pre-graduate-school)

FALL	WINTER	SPRING
JUNIOR YEAR		
Phys. 100A	Phys. 100B	Phys. 120A
Phys. 105A	Phys. elective[3]	Phys. 130A
Phys. 110A	Phys. 105B[2]	
SENIOR YEAR		
Phys. 140A	Phys. 140B[2]	Phys. lab[1]
Phys. 130B	Phys. elective[3]	Phys. elective[3]

[1] Any course from lab group listed above

[2] Any two courses from theoretical or experimental pre-grad-school sequence listed above

[3] Any restricted elective as described above

Suggested Schedule (career in industry)

FALL	WINTER	SPRING
JUNIOR YEAR		
Phys. 100A	Phys. 100B	[pre-grad][4]
Phys. 105A	Phys. elective[3]	Phys. 120A
Phys. 110A	[other][5]	Phys. 130A
SENIOR YEAR		
Phys. 140A	[pre-grad][4]	Phys. elective[3]
Phys. lab[2]	Phys. elective[3]	[other][5]
Phys. 130B	[other][5]	

[2] Any course from lab group listed above

[3] Any restricted elective as described above

[4] any course from either pre-grad-school sequence listed above

[5] any other course as approved by adviser (optional)

Physics Major with Specialization in Astrophysics (B.S. Degree)

The astrophysics specialization is appropriate for students who would like to gain an in-depth understanding of modern astronomy and astrophysics, and/or who wish to prepare for graduate school in astronomy or astrophysics. It is similar to the standard physics major with electives being chosen from astronomically oriented courses. A wide variety of technical, academic, and professional careers are possible for students who choose this specialization.

The following courses are required for the physics major with specialization in astrophysics:

Lower-Division

1. Physics 4A-B-C-D-E or Physics 2A-B-C-D[1]
2. Physics 2CL and 2DL
3. Chemistry 6A or[2] a programming course such as MAE 9 or MAE 10
4. Mathematics 20C-D-E-F

[1] The Physics 4 series is recommended, but the Physics 2 sequence is acceptable, in which case both

[2] Chemistry 6A and a programming course are required.

Upper-Division

1. Physics 100A-B, 105A, 110A, 120A, 130A-B, 140A and an additional laboratory course from the lab group: 120B, 121, 133.
2. Two courses from either the theoretical or experimental pre-grad-school sequence.
3. It is recommended that students take the three quarter astrophysics sequence—Physics 160, 161, 162—but any three courses selected from the following list are acceptable:

   Physics 160. Stellar Astrophysics

   Physics 161. Compact Objects and the Milky Way

   Physics 162, Galaxies and Cosmology

   Physics 163, Solar System

   ECE 120, Solar System Physics

   Chem. 170, Cosmochemistry

   Erth. 130, Geodynamics of Terr. Planets

   MAE 180A, Space Science and Engineering 180 A/B

   Physics 223, Stellar Structure and Evolution; with consent of Instructor

   Physics 224, Interstellar Medium; with consent of Instructor

   Physics 226, Galaxies & Galactic Dynamics; with consent of Instructor

   Physics 227, Cosmology; with consent of Instructor

   Physics 228, High Energy and Compact Objects; with consent of Instructor

   Theoretical pre-grad-school sequence: Phys. 100C, 105B, 110B, 130C, 140B

   Experimental pre-grad-school sequence: Phys. 100C, 110B, 120B, 130C, 140B

Example Schedule

FALL	WINTER	SPRING
JUNIOR YEAR		
Phys 100A	Phys 100B	Phys 120A
Phys 105A	Phys 105B[1]	Phys 130A
Phys 110A		
SENIOR YEAR		
Phys 140A	Phys 140B	Physics Lab[2]
Phys 160	Phys 161	Phys 162
Phys 130B		

[1] Experimentalists may replace 105B with an additional lab.

[2] Any course from lab group listed above

Physics Major with Specialization in Biophysics (B.S. Degree)

The Department of Physics offers an undergraduate program that prepares students for careers in biophysics. This program leads to a degree in "B.S., Physics with Specialization in Biophysics." As a terminal degree, it is an excellent education for students who wish to work in the biotechnology industry, and provides an ideal background for students who plan to attend graduate or professional school in biological or biomedical fields.

This program is intended for students with a strong interest in bringing the concepts and technical advances from the physical sciences to bear on issues in biology. The curriculum is chosen to prepare students as rigorously trained but broad-minded generalists, so that they may attack problems in the biological, biochemical, and biomedical sciences with the tools and confidence that come from rigorous training in the physical sciences.

The curriculum for Physics Major with Specialization in Biophysics is designed to allow premedical students to complete all necessary courses for admission to medical schools.

The lower-division program for physics majors with specialization in biophysics includes basic courses in biology and chemistry as well as physics. Although the sequence Physics 4A through 4E is strongly recommended, students have the choice of petitioning the department to substitute the sequence Physics 2A through 2D.

The following courses are required for the physics major with specialization in biophysics:

Lower-Division

1. Physics 4A-B-C-D-E and 2CL-DL; or Physics 2A-B-C-D and 2CL-DL (Physics 4 sequence is strongly recommended)
2. Chemistry 6A-B-C and 6BL
3. Biology, BILD 1 and BILD 2
4. Mathematics 20A-B-C-D-E-F

The upper-division program includes advanced courses in physics, including two core lecture courses and one core laboratory course in biophysics, as well as organic chemistry.

Upper-Division

1. Physics 100A, 105A, 110A, 120A, 130A, 140A, 171, 172, 173
2. Chemistry 140A

Additional electives, to achieve a count of twelve upper-division courses in the major, may be selected from biology, chemistry and physics. Three additional upper-division courses, in any subject, are required in order to satisfy UCSD requirements.

Premedical students will need to take two additional quarters of organic chemistry (Chemistry 140B and 140C), one quarter of organic chemistry laboratory (Chemistry 143A), and one quarter of an upper level biology course. In addition, some medical schools also require a quarter of biochemistry (Biology BIBC 100 or Chemistry 114A). The premedical requirements may be used to satisfy elective requirements for upper-division courses.

As a guide to prospective students, we consider a schedule of required classes for a Muir College student.

Suggested Schedule

FALL	WINTER	SPRING
FRESHMAN YEAR		
Math. 20A	Chem. 6A	Chem. 6B
	Math. 20B	Chem. 6BL
	Phys. 4A	Math. 20C
		Phys. 4B
SOPHOMORE YEAR		
Chem. 6C	Math. 20E	Math. 20F
Math. 20D	Phys. 4D	Phys. 4E
Phys. 4C	Phys. 2CL	Phys. 2DL
JUNIOR YEAR		
Phys. 100A	BILD 1	BILD 2
Phys. 105A	Chem. 140A	Phys. 120A
Phys. 110A		Phys. 130A
SENIOR YEAR		
	Phys. 172	
Phys. 140A	Elec.	Phys. 173
Phys. 171	Elec.	

B.S. in Physics with Specialization in Computational Physics

The computational physics specialization is designed to support a broad range of career development tracks, so students may pursue (1) a terminal B.S. degree for gainful employment in information technology and high-tech industry, (2) preparation for graduate studies in computational science with an M.S. degree, and (3) graduate work in physics with strong interest in computational physics. This flexibility is afforded by a wide array of restricted electives which allows students to design much of their own program (subject to adviser's approval) while simultaneously maintaining the essential physics-based curriculum. Academic advising will be provided by physics faculty in the Computational Physics Specialization Program to assist students in designing their optimal career development track in the flexible curriculum.

The following courses are required for Physics Major with Specialization in Computational Physics:

Lower-Division

1. Physics 4A-B-C-D-E or Physics 2A-B-C-D[1], Physics 2CL-DL
2. Mathematics 20C-F
3. Chemistry 6A
4. MAE 9, or MAE 10, or CSE 11[2]

[1] The 2A-B-C-D sequence is an allowed substitute by petition.

[2] Electing CSE 11, student is still required to have C or Fortran based programming skills equivalent to MAE 9, or MAE 10.

Upper-Division

1. Physics 100A-B, 105A-B, 110A, 120A, 121, 130A-B, 140A, 141, 142
2. Six restricted electives from following groups:

   Physics 100C, 110B, 120B, 130C, 140B, 173, other upper-division Physics courses, Mathematics 132A-B, 170A-C, 172, 173, 183 CSE 12, 30, 80

   Substitute Upper-Division courses[3]

Suggested Schedule (restricted electives not shown)

FALL	WINTER	SPRING
JUNIOR YEAR		
Phys. 100A	Phys. 100B	Phys. 120A
Phys. 105A	Phys. 105B	Phys. 130A
Phys. 110A		
SENIOR YEAR		
Phys. 140A	Phys. 141	Phys. 142
Phys. 130B	Phys. 121	

[2] Students will choose two required courses from the group Phys. 121, Phys. 141, Phys. 142, and either will drop the third, or take it as one of the six restricted electives

[3] Substitute elective courses (upper-division science, mathematics, engineering, or other) require adviser's approval

Career Track Examples with Restricted Electives

The program of electives is intended to be flexible, and can be tailored to the student's needs and interests in consultation with the academic adviser.

Grad. School Theorist with Computational Interest Track for student with interest in theoretical physics based computational science:

Physics 100C, 110B, 130C, 140B
Mathematics 132A-B

Grad. School Experimentalist with Computational Interest Track for students with interest in experimental physics based computational science:

Physics 100C, 120B, 142
Mathematics 183
CSE 80

Information Technology Track for student with interest in physics based software oriented applications:

Physics 100C, 140B
CSE 12, 30, 80
Mathematics 173

Numerical Science/Engineering Application Developer Track for students with interest in physics and engineering applications of numerical algorithms:

Physics 100C, 140B
Mathematics 170A-C, 172

High Tech Instrumentation Track for students with interest in physics based instrumentation:

Physics 100C, 120B, 140B
Mathematics 183
CSE 12, 80

Physics Major with Specialization in Earth Sciences (B.S. Degree)

The upper-division program for physics majors with specialization in earth sciences is essentially the same as the standard physics major augmented by courses in earth sciences.

Students may wish to incorporate a small portion of the major program into their lower-division studies, for example, Earth Sciences 101.

The following courses are required for the physics major with specialization in earth sciences:

Lower-Division

1. Physics 4A-B-C-D-E and 2CL-DL; or Physics 2A-B-C-D and 2CL-DL (Physics 4 sequence is strongly recommended)
2. Chemistry 6A-B and 6BL
3. Mathematics 20C-F

Upper-Division

1. Physics 100A-B, 105A, 110A-B, 120A, 130A, 140A, plus one upper-division lab*
2. Earth Sciences 101, 102, 103, 120
3. Restricted Electives: three upper-division earth science (four-unit) or graduate courses to be chosen with the approval of the SIO earth sciences adviser
4. Two courses from either the theoretical or experimental pre-grad school sequence.

* Another lab course chosen from Physics 120B, 121, 133, or 173.

Suggested Schedule

FALL	WINTER	SPRING
JUNIOR YEAR		
Phys. 100A	Phys. 100B	Phys. 120A
Phys. 105A	Phys. 110B	Phys. 130A
Phys. 110A	Earth Sci. 102	
Earth Sci. 101		
SENIOR YEAR		
Phys. 140B	Earth Sci. 120	U.D. Lab
Earth Sci. 103	Restr. Elec.	Restr. Elec
		Restr. Elec.

Physics Major with Specialization in Materials Physics (B.S. Degree)

The materials physics specialization is designed to support a broad range of options, so students may pursue (1) a terminal B.S. degree, or preparation for (2) graduate work in materials science, or (3) graduate work in physics. This flexibility is afforded by a wide range of restricted electives which allows students to design much of their own program while simultaneously maintaining the essential physics-based curriculum. Academic advising will be provided by the department to assist the student in navigating through the many options. The B.S. program also serves as the entry to the integrated five-year B.S./M.S. program.

Lower-Division

1. Physics 4A-B-C-D-E or Physics 2A-B-C-D, Physics 2CL-DL
2. Chemistry 6A-B*
3. Mathematics 20C-F
4. MAE 9 or MAE 10 (or equivalent programming experience)

Upper-Division

1. Physics 100A-B, 105A-B, 110A, 120A-B, 130A-B, 140A, 133, 152A-B
2. Four restricted electives, to be chosen from Chemistry 120A-B*; Mathematics 120A; ECE 103, 134, 135A-B, 136, 136L; MAE 160, 110A; or any upper division physics course

* Students who anticipate taking Chemistry 120A-B as an upper-division elective are strongly advised to take Chemistry 6C.

Suggested Schedule (restricted electives not shown)

FALL	WINTER	SPRING
JUNIOR YEAR		
Phys. 100A	Phys. 100B	Phys. 120A
Phys. 105A	Phys. 105B	Phys. 130A
Phys. 110A		
SENIOR YEAR		
Phys. 140A	Phys. 152A	Phys. 152B
Phys. 120B		Phys. 133
Phys. 130B		

Restricted Electives: Example

As examples of restricted electives, a student opting for a terminal B.S. degree (Option 1) might choose to take MAE 160, ECE 103, 136, and Physics 121. Students preparing for graduate work in materials science (Option 2) might consider MAE 160, ECE 103, 134, and a fourth elective. Students preparing for graduate work in physics (Option 3) might consider Physics 100C, 110B, 140B, and a fourth elective. The program of electives is intended to be flexible, and

can be tailored to the student's needs and interests in consultation with the academic adviser.

See entry for Integrated Bachelor's/Master's Degree Program in Materials Physics.

General Physics Major (B.A. Degree)

This program covers the essential topics in physics and provides a broadly based education in the natural sciences. Starting with lower-division courses in mathematics, physics, computing, biology and/or chemistry, students proceed to upper-division mechanics, electricity and magnetism, thermal physics, quantum physics, and a physical measurements laboratory course. In addition, students take sixteen units of upper-division elective courses in the natural sciences or mathematics.

While the B.A. program is suitable for students who pursue a terminal degree in physics or use it as a preparation for other professional careers, it is not intended for those who wish to proceed to the Ph.D. in physics. The latter should enroll in the B.S. program.

The following courses are required for the general physics major:

Lower-Division

1. Physics 2A-B-C-D and 2CL-DL
2. Mathematics 20C-F
3. Three restrictive elective courses in science and engineering (a list of acceptable courses is given below)

Upper-Division

1. Physics 100A-B, 105A, 110A-B, 120A, 130A, 140A or Chemistry 127 or 131
2. Restricted Electives: Sixteen units of upper-division courses in science and engineering (excluding mathematics)

Suggested Schedule

FALL	WINTER	SPRING
JUNIOR YEAR		
Phys. 100A	Phys. 100B	Phys. 120A
Phys. 105A	Phys. 110B	Phys. 130A
Phys. 110A		
SENIOR YEAR		
Phys. 140A or	Restr. Elec	Restr. Elec.
Chem. 127 or 131	Restr. Elec.	
Restr. Elec.		

Approved Lower-Division Elective Courses

One course in computing chosen from the following list:

MAE 10, FORTRAN for Engineers

MAE 03, Introduction to Engineering Graphics and Design

CSE 10, Introduction to Programming Techniques

CSE 30, Introduction to Systems Programming

Physics 105B, Mathematical and Computational Physics

Plus **two** of the following courses:

BILD 1, The Cell

BILD 2, Multicellular Life

BILD 3, Organismic and Evolutionary Biology

Chem. 6A, General Chemistry

Chem. 6B, General Chemistry

Chem. 6C, General Chemistry

Chem. 6BL plus 6CL, General Chemistry Lab plus Intro. Analytical Chemistry

General Physics/Secondary Education Major (B.A. Degree)

This program is intended for students preparing for a career as a physics teacher in secondary schools. It covers the essential topics in physics and provides a broadly based education in the natural sciences. The program includes three courses in general chemistry plus a lab, one course in organic chemistry plus a lab, and a course in earth science as required by the Single Subject Credential Program of the state of California. It also includes three courses in Practicum in Learning offered by the Teacher Education Program. This degree is particularly suitable for students pursuing a Single Subject (Physics) credential for high schools. If you are interested in earning a California teaching credential from UCSD, contact the Teacher Education Program (TEP) for information about the prerequisite and professional preparation requirements. It is recommended that you contact TEP as early as possible in your academic career.

The following courses are required for the general physics/secondary education major:

Lower-Division

1. Physics 2A-B-C-D and 2CL-DL
2. Chemistry 6A-B-C and 6BL
3. Earth Sciences 10, 12, or 30
4. Mathematics 20C-F

Upper-Division

1. Physics 100A-B, 105A, 110A-B, 120A, 130A
2. Chemistry 140A and 143A
3. Earth Sciences 101
4. TEP 129A-B-C

Suggested Schedule

FALL	WINTER	SPRING
JUNIOR YEAR		
Phys. 100A	Phys. 100B	Phys. 130A
Phys. 105A	Phys. 110B	Phys. 120A
Phys. 110A	Chem. 140A	Chem. 143A
SENIOR YEAR		
Earth Sci. 101	TEP 129B	TEP 129C
TEP 129A		

Engineering Physics Program

The engineering physics program is offered jointly by the Departments of Physics, MAE, and ECE, and is administered by the Department of ECE. (See "ECE, Engineering Physics Program.") Transfer students who have had prior course work in the major at other institutions must consult with the Department of Physics, Student Affairs Office, 1110-115 Urey Hall Addition to make an appointment to see a faculty adviser.

Minor in Physics

Students may arrange minor programs or programs of concentration in physics by consulting with the Department of Physics Student Affairs Office, 1110-115 Urey Hall Addition, and their college for specific requirements. The Department of Physics requires at least twenty-eight units, of which at least twenty units must be upper-division. All courses must be taken for a letter grade. Lower-division transfer courses are permitted.

Advising Office

All students are assigned an academic adviser. It is strongly recommended students see their adviser at least once a quarter.

Additional advising information may be obtained from the Department of Physics Student Affairs Office, 1110-115 Urey Hall Addition (858) 534-3290.

Honors Program

The Department of Physics offers an Honors Program for students who demonstrate excellence

in the major. Students interested in the Honors Program should consult the Student Affairs Office. Eligibility for the Honors Program includes completion of all required lower-division physics courses, ten upper-division physics courses, and a GPA of a least 3.50 in the physics major.

The Honors Program consists of a minimum of eight units of Honors Thesis Research (Physics 199H), an Honors Thesis, and the presentation of the research to faculty and peers at UCSD's Undergraduate Research Conference or an Undergraduate Seminar. Admission to the Honors Program is contingent upon the prior approval of the Honors Thesis "research topic" by the Vice Chair for Education.

Integrated Bachelor's/Master's Degree Program in Materials Physics

The program offers a M.S. in physics with specialization in materials physics. **It is open only to UCSD undergraduates, and is a Plan I program only (thesis).** During the fourth quarter prior to receipt of the B.S. degree, students enrolled in the B.S. degree program with specialization in materials physics (see above) may apply for admission to the M.S. program. To be eligible, students must have completed the first two quarters of their junior year in residence at UCSD and have a GPA of at least 3.0 in both their major and overall undergraduate curriculum. It is strongly recommended that B.S. students who intend to apply to the M.S. program take MAE 160, ECE 103, and ECE 134 as restricted B.S. electives. It is the responsibility of the prospective B.S./M.S. student to select a faculty member (from the Department of Physics or, with physics department approval, from the MAE, ECE, or chemistry departments) who would be willing to serve as the student's adviser and with whom the student would complete at least twelve units of S/U graded research, which could commence as early as the undergraduate senior year. (Taken during the senior year, the units would count only toward the M.S. degree and not toward the B.S.) The student must confirm that the selected faculty adviser will not be on off-campus sabbatical leave during any quarter of the scheduled B.S./M.S. project. Students are expected to meet the requirements for the M.S. degree in one year (three consecutive, contiguous academic quarters) from the date of receipt of the B.S. degree. Any deviation from this plan, such as a break in enrollment for one or more quarters, may result in the student being dropped from the program.

The requirements for the M.S. degree are as follows:

1. Completion of at least twelve and no more than twenty-four units of research, which *may* begin as early as the first quarter of the senior undergraduate year.
2. Completion of three required courses during the fifth (graduate) year (MAT SCI 201A-B-C), and two restricted electives (see below).
3. Completion of restricted elective courses so that the total number of units (research plus required courses plus elective courses) totals no less than 36 units taken as a graduate student. Students accumulate units for their research by enrolling in Physics 295 (M.S. Thesis Research), which may be taken repeatedly.
4. Maintenance of a grade-point average of at least 3.0 for all course work, both cumulatively and for each quarter of enrollment in the B.S./M.S. program.
5. Completion of a thesis, with an oral presentation to, and approval of, a three-member committee from the Department of Physics including the faculty adviser. If the faculty adviser is from outside the physics department, the committee shall consist of the adviser and two members from the physics department faculty.
6. Three complete, separate, and consecutive quarters of full-time residency as a graduate student which will commence the quarter immediately following the quarter in which the B.S. degree is awarded (not counting summer session).
7. Although students may receive research or teaching assistantships if available from their adviser or through the Department of Physics, there is no guarantee of financial support associated with the M.S. program.
8. M.S. candidates will be permitted to serve as teaching assistants, although teaching will not be a requirement for the degree. Students who obtain a teaching assistantship should make sure that it does not interfere with completion of the M.S. degree requirements within the one year time frame allotted.

M.S. Program: Fifth Year Curriculum

1. MAT SCI 201A-B-C
2. Physics 295 (M.S. Thesis Research)
3. Two restricted electives, to be chosen from Physics 201, 211A-B; MAT SCI 227, 240A-B-C; ECE 231, 233: other courses allowed by petition

The Graduate Program

The Department of Physics offers curricula leading to the following degrees:

M.S., Physics
C.Phil., Physics
Ph.D., Physics
Ph.D., Physics (Biophysics)

Biophysics students will receive their M.S. and C.Phil. degrees in physics. Only their Ph.D. will be in physics (biophysics).

Entering graduate students are required to have a sound knowledge of undergraduate mechanics, electricity and magnetism; to have had senior courses or their equivalent in atomic and quantum physics, nuclear physics, and thermodynamics; and to have taken upper-division laboratory work. An introductory course in solid-state physics is desirable.

Requirements for the master of science degree can be met according to Plan II (comprehensive examination). (See "Graduate Studies: The Master's Degree.") The comprehensive examination is identical to the first-year departmental examination for Ph.D. students. A list of acceptable courses is available in the Department of Physics Graduate Student Affairs office. There is no foreign language requirement.

Doctoral Degree Program

The department has developed a flexible Ph.D. program which provides a broad, advanced education in physics while at the same time giving students opportunity for emphasizing their special interests. This program consists of graduate courses, apprenticeship in research, teaching experience, and thesis research.

Entering students are assigned a faculty adviser to guide them in their program. Many students spend their first year as teaching assistants or fellows and begin apprentice research in their second year. When a student's association with a research area and research supervisor is well established, a faculty research

progress committee is formed with the responsibility of conducting an annual review of progress and, at the appropriate time, initiating the formation of a doctoral committee. After three years of graduate study, or earlier, students complete the departmental examinations and begin thesis research. Students specializing in biophysics make up deficiencies in biology and chemistry during the first two years and complete the departmental examinations by the end of their third year of graduate study. There is no foreign language requirement.

Entrance Testing

An entrance test covering undergraduate physics is given to entering students during the first week of orientation to give better guidance to students in their graduate program. The results are not entered in the student's file. Entering students are encouraged, but not obliged, to bring the results to the first meeting with their academic adviser. Entering students may elect to take the departmental examination instead of taking the entrance test.

Requirements for the Ph.D.

Students are required to pass a departmental examination, advanced graduate courses, a qualifying examination, teaching requirement and a final defense of the thesis as described below.

1. DEPARTMENTAL EXAMINATION

Physics students are required to take the departmental examination after completing one year of graduate work at UCSD. The examination is on the level of material usually covered in upper-division courses and the graduate courses listed below:

Fall

Physics 200A (Theoretical Mechanics)
Physics 201 (Mathematical Physics)
Physics 212A (Quantum Mechanics)

Winter

Physics 200B (Theoretical Mechanics)
Physics 203A (Adv. Classical Electrodynamics)
Physics 212B (Quantum Mechanics)

Spring

Physics 203B (Adv. Classical Electrodynamics)
Physics 210A (Equilibrium Statistical Mechanics)
Physics 212C (Quantum Mechanics)

The examination is offered twice a year, at the beginning of the fall and spring quarters, and lasts two days, four hours per day. The examination may be repeated once, the next time it is offered.

Biophysics students take the departmental examination after completing two years of graduate work.

2. ADVANCED GRADUATE COURSES

Physics students are required to take five advanced graduate courses (with a grade of C or better) from at least three of the groups listed below no later than the end of the third year of graduate work. A 3.0 average in four of the five courses is required. (In lieu of the course requirement, students may petition to take an oral examination covering three areas of physics.)

Group 1: Physics 218A-B-C (Plasma); 234 (Nonneutral Plas.); 235 (Nonlin. Plas. Th.)

Group 2: Physics 210B (Nonequil. Stat. Mech.); 210C, 211A, 211B (Solid State); 219 (C.M./Matl. Sci. Lab), 230 (Adv. Solid State); 232 (Electronic Materials); 236 (Many-body Th.)

Group 3: Physics 214 (Elem. Part.); 215A-B-C (Part. & Fields); 217 (Renorm. Field Th.); 222 (Exp. Tech. Part. Phys.)

Group 4: Physics 220 (Group Th.); 221A, 221B (Nonlinear Dyn.); Physics 241 and 242 (Comp. Phys); Mathematics 210A-B, 210C (Mathematics Physics); Mathematics 259A-B-C (Geom. Physics)

Group 5: Physics 206 (BioPhysics); Physics 207 (X-ray Crystallography); 225A-B (Relativ.); 271 (Bio. Neurons/Net); 272 (Bio. Molecules)

Group 6: Physics 223 (Stel. Str.); 224 (Intrstel. Med.); 226 (Gal. & Gal. Dyn.); 227 (Cosmology), 228 (HE Astro. & Comp. Obj.)

Biophysics students select five courses from biology, biochemistry, chemistry, or physics in consultation with their adviser. At least three courses must be graduate courses.

3. QUALIFYING EXAMINATION AND ADVANCEMENT TO CANDIDACY

In order to be advanced to candidacy, students must have met the departmental requirements and obtained a faculty research supervisor. At the time of application for advancement to candidacy, a doctoral committee responsible for the remainder of the student's graduate program is appointed by the Graduate Council. The committee conducts the Ph.D. qualifying examination during which students must demonstrate the ability to engage in thesis research. Usually this involves the presentation of a plan for the thesis research project. The committee may ask questions directly or indirectly related to the project and questions on general physics which it determines to be relevant. Upon successful completion of this examination, students are advanced to candidacy and are awarded the Candidate of Philosophy degree.

4. INSTRUCTION IN PHYSICS TEACHING

All graduate students are required to participate in the physics undergraduate teaching program as part of their career training. The main component of this requirement is an evaluated classroom-based teaching activity. All graduate student teaching accomplishments are subject to the approval of the vice chair for education. There are several ways to satisfying the teaching requirement, including: (1) leading discussions as a teaching assistant, (2) practical classroom teaching, under faculty supervision, (3) participation in an approved teaching development program offered by the Department of Physics or the campus Center for Teaching Development, or (4) transferred teaching credit from another institution or department. Students who satisfy the requirement by teaching at UCSD should enroll in Physics 500 during the quarter in which they complete it.

5. THESIS DEFENSE

When students have completed their theses, they are asked to present and defend them before their doctoral committees.

TIME LIMITS FOR PROGRESS TO THE PH.D.

In accordance with university policy, the Department of Physics has established the following time limits for progress to the Ph.D. A student's research progress committee helps ensure that these time limits are met.

	Theorists	Experimentalists
Advancement to Candidacy	4 years	5 years
Total Registered Time and Support	7 years	8 years

Departmental Colloquium

The department offers a weekly colloquium on topics of current interest in physics and on departmental research programs. Students are expected to register and attend the colloquium.

Supplementary Course Work and Seminars

The department offers regular seminars in several areas of current interest. Students are strongly urged to enroll for credit in seminars related to their research interests and, when appropriate, to enroll in advanced graduate courses beyond the departmental requirement. To help beginning students choose a research area and a research supervisor, the department offers a special seminar (Physics 261) that surveys physics research at UCSD.

Course Credit by Examination

Students have an option of obtaining credit for a physics graduate course by taking the final examination without participating in any class exercises. They must, however, officially register for the course and notify the instructor and the Department of Physics graduate student affairs office of their intention no later than the first week of the course.

COURSES

LOWER-DIVISION

The Physics 1 sequence is primarily intended for biology.

The Physics 2 sequence is intended for physical science and engineering majors and those biological science majors with strong mathematical aptitude.

The Physics 4 sequence is intended for all physics majors and for students with an interest in physics. This five-quarter sequence covers the same topics as the Physics 2 sequence, but it covers these topics more slowly and in more depth. The Physics 4 sequence provides a solid foundation for the upper-division courses required for the physics major.

Note: Since some of the material is duplicated in the Physics 1, 2 and 4 sequences, credit cannot be obtained for both. Please check with the Physics Student Affairs Office when switching sequences. (Example: Physics 1A followed by Physics 2A, no credit for Physics 2A.)

Physics 5, 6, 7, 8, 9, 10, 11, and 12 are intended for non-science majors. Physics 5, 6, 7, 8, 9, 10, and 12 do not use calculus while Physics 11 uses some calculus.

1A. Mechanics (3)
First quarter of a three-quarter introductory physics course, geared towards life-science majors. Equilibrium and motion of particles in Newtonian mechanics, examples from astronomy, biology and sports, oscillations and waves, vibrating strings and sound. *Prerequisites: Mathematics 10A or 20A, prior or concurrent enrollment in Mathematics 10B or 20B, concurrent enrollment in Physics 1AL laboratory.* (F,W,S)

1AL. Mechanics Laboratory (2)
Physics laboratory course to accompany Physics 1A. Experiments in mechanics. *Prerequisite: concurrent enrollment in Physics 1A.* (F,W,S)

1B. Electricity and Magnetism (3)
Second quarter of a three-quarter introductory physics course geared toward life-science majors. Electric fields, magnetic fields, DC and AC circuitry. *Prerequisites: Physics 1A, 1AL and prior or concurrent enrollment in Mathematics 10C-D or 20C. Concurrent enrollment in Physics 1BL.* (F,W,S)

1BL. Electricity and Magnetism Laboratory (2)
Physics laboratory course to accompany Physics 1B. Experiments in electricity and magnetism. Course materials fee is required. *Prerequisite: concurrent enrollment in Physics 1B.* (F, W, S)

1C. Diffusion, Radiation, and Modern Physics (Lecture and Laboratory) (5)
Third quarter of a three-quarter calculus-based lecture and laboratory introductory physics course geared toward life-science majors. Behavior of systems under combined thermal and electric forces, the interaction of light with matter as illustrated through optics and quantum mechanics. Examples from biology and instrumentation. *Prerequisites: Physics 1B and Mathematics 10C or Mathematics 10D or 20C.* (F,W,S) (Course materials fee is required.) (Not offered after fall 2004)

1C. Waves, Optics, and Modern Physics (3)
Third quarter of a three-quarter introductory physics course geared toward life-science majors. Behavior of systems under combined thermal and electric forces, the interaction of light with matter as illustrated through optics and quantum mechanics. Examples from biology and instrumentation. (First offered winter 2005) *Prerequisites: Physics 1B, 1BL, Mathemat-ics 10C or 10D or 20C. Concurrent enrollment in Physics 1CL.* (F, W, S)

1CL. Waves, Optics, and Modern Physics Laboratory (2)
Physics laboratory course to accompany Physics 1C. Experiments in waves, optics, and modern physics. Course materials fee is required. First offered in winter 2005. *Prerequisite: concurrent enrollment in Physics 1C.* (F, W, S)

2A. Physics–Mechanics (4)
A calculus-based science-engineering general physics course covering vectors, motion in one and two dimensions, Newton's first and second laws, work and energy, conservation of energy, linear momentum, collisions, rotational kinematics, rotational dynamics, equilibrium of rigid bodies, oscillations, gravitation. *Prerequisites: Mathematics 20A, and concurrent enrollment in Mathematics 20B.* (F,W,S)

2B. Physics–Electricity and Magnetism (4)
Continuation of Physics 2A covering charge and matter, the electric field, Gauss's law, electric potential, capacitors and dielectrics, current and resistance, electromotive force and circuits, the magnetic field, Ampere's law, Faraday's law, inductance, electromagnetic oscillations, alternating currents and Maxwell's equations. *Prerequisites: Physics 2A, Mathematics 20B, and concurrent enrollment in Mathematics 20C.* (F,W,S)

2BL. Physics Laboratory–Mechanics and Electrostatics (2)
One hour lecture and three hours' laboratory. Experiments include gravitational force, linear and rotational motion, conservation of energy and momentum, collisions, oscillations and springs, gyroscopes. Experiments on electrostatics involve charge, electric field, potential, and capacitance. Data reduction and error analysis are required for written laboratory reports. *Prerequisite: concurrent enrollment in Physics 2B or 4C.* (F,W,S) Course materials fee is required.

2C. Physics–Fluids, Waves, Thermodynamics, and Optics (4)
Continuation of Physics 2B covering fluid mechanics, waves in elastic media, sound waves, temperature, heat and the first law of thermodynamics, kinetic theory of gases, entropy and the second law of thermodynamics, Maxwell's equations, electromagnetic waves, geometric optics, interference and diffraction. *Prerequisites: Physics 2B, Mathematics 20C, and concurrent enrollment in Mathematics 20D.* (F,W,S)

2CL. Physics Laboratory–Electricity and Magnetism, Waves, and Optics (2)
One hour lecture and three hours' laboratory. Experiments on refraction, interference/diffraction using lasers and microwaves; lenses and the eye; acoustics; oscilloscope and L-R-C circuits; oscillations, resonance and damping, measurement of magnetic fields; and the mechanical equivalence of heat. *Prerequisites: prior or concurrent enrollment in Physics 1C, 2C, or 4D.* (F,W,S) Course materials fee is required.

2D. Physics–Relativity and Quantum Physics (4)
A modern physics course covering atomic view of matter, electricity and radiation, atomic models of Rutherford and Bohr, relativity, X-rays, wave and particle duality, matter waves, Schrπdinger's equation, atomic view of solids, natural radioactivity. *Prerequisites: Physics 2B and Mathematics 20D.* (F,W,S)

2DL. Physics Laboratory–Modern Physics (2)
One hour of lecture and three hours of laboratory. Experiments to be chosen from refraction, diffraction and interference of microwaves, Hall effect, thermal band gap, optical spectra, coherence of light, photoelectric effect, e/m ratio of particles, radioactive decays, and plasma physics. *Prerequisites: 2BL or 2CL, prior or concurrent enrollment in Physics 2D or 4E.* (S) Course materials fee is required.

4A. Physics for Physics Majors–Mechanics (4)
The first quarter of a five-quarter calculus-based physics sequence for physics majors and students with a serious interest in physics. The topics covered are vectors, particle kinematics and dynamics, work and energy, conservation of energy, conservation of momentum, collisions, rotational kinematics and dynamics, equilibrium of rigid bodies. *Prerequisites: Mathematics 20A and concurrent enrollment in Mathematics 20B.* (W)

4B. Physics for Physics Majors–Mechanics, Fluids, Waves, and Heat (4)
Continuation of Physics 4A covering oscillations, gravity, fluid statics and dynamics, waves in elastic media, sound waves, heat and the first law of thermodynamics, kinetic theory of gases, second law of thermodynamics, gaseous mixtures and chemical reactions. *Prerequisites: Physics 4A, Mathematics 20B and concurrent enrollment in Mathematics 20C.* (S)

4C. Physics for Physics Majors–Electricity and Magnetism (4)
Continuation of Physics 4B covering charge and Coulomb's law, electric field, Gauss's law, electric potential, capacitors and dielectrics, current and resistance, magnetic field, Ampere's law, Faraday's law, inductance, magnetic properties of matter, LRC circuits, Maxwell's equations. *Prerequisites: Physics 4B, Mathematics 20C and concurrent enrollment in Mathematics 20E.* (F)

4D. Physics for Physics Majors–Electromagnetic Waves, Optics, and Special Relativity (4)
Continuation of Physics 4C covering electromagnetic waves and the nature of light, cavities and wave guides, electromagnetic radiation, reflection and refraction with applications to geometrical optics, interference, diffraction, holography, special relativity. *Prerequisites: Physics 4C, Mathematics 20D and concurrent enrollment in Mathematics 20F.* (W)

4E. Physics for Physics Majors–Quantum Physics (4)
Continuation of Physics 4D covering experimental basis of quantum mechanics: Schrödinger equation and simple applications; spin; structure of atoms and molecules; selected topics from solid state, nuclear, and elementary particle physics. *Prerequisites: Physics 4D, Mathematics 20E, and concurrent enrollment in Mathematics 20D.* (S)

5. The Universe (4)
Introduction to astronomy. Topics include the earth's place in the universe; the atom and light; the birth, life, and death of stars; the Milky Way galaxy; normal and active galaxies; and cosmology. Physics 5 or 7, and Earth Sciences 10 and 30 form a three-quarter sequence. Students may not receive credit for both Physics 5 and Physics 7. Restricted to P/NP grading option if taken after Physics 1A, 2A, or 4A. (F,S)

6. Physics of Space Science and Exploration (4)
Descriptive introduction to basic physics concepts relevant to space science and exploration. Topics include gravity; orbits, weightlessness, and Kepler's laws; the Earth's physical environment (including its atmosphere, its magnetic field, and radiation from the sun); and light as an electromagnetic wave. These topics form the basis for an introduction to the space program and discussion of the scientific reasons for performing experiments or observations in space. Restricted to P/NP grading option if taken after Physics 1A, 2A, or 4A. (W) (Not offered in 2004–2005.)

7. Introductory Astronomy (4)
Introduction to astronomy and astrophysics. Topics same as Physics 5. This course uses basic pre-calculus level mathematics (algebra, proportions, logs, similar triangles). Physics 5 or 7 and Earth Sciences 10 and 30 form a three-quarter sequence. Students may not receive credit for both Physics 5 and Physics 7. Restricted to P/NP grading option if taken after Physics 1A, 2A, or 4A. (W)

8. Physics of Everyday Life (4)
Examines phenomena and technology encountered in daily life from a physics perspective. Topics include waves, musical instruments, telecommunication, sports, appliances, transportation, computers, and energy sources. Physics concepts will be introduced and discussed as needed employing some algebra. No prior physics knowledge is required. Restricted to P/NP grading option if taken after Physics 1A, 2A, or 4A. (S)

9. The Solar System (4)
A non-mathematical exploration of our Solar System and other planetary systems for non-science majors. The sun, terrestrial and giant planets, satellites, asteroids, comets and meteors. The formation of planetary systems, space exploration, the development and search for life. (F)

10. Concepts in Physics (4)
This is a one-quarter general physics course for non-science majors. Topics covered are motion, energy, heat, waves, electric current, radiation, light, atoms and molecules, nuclear fission and fusion. This course emphasizes concepts with minimal mathematical formulation. *Prerequisite: college algebra or equivalent.* Restricted to P/NP grading option if taken after Physics 1A, 2A, or 4A. (W)

11. Survey of Physics (4)
Survey of physics for non-science majors with strong mathematical background, including calculus. Physics 11 describes the laws of motion, gravity, energy, momentum, and relativity. A laboratory component consists of two experiments with gravity and conservation principles. *Prerequisites: Mathematics 10A or 20A and concurrent enrollment in Math 10B or 20B.* (F)

12. Energy and the Environment (4)
A course covering energy fundamentals, energy use in an industrial society and the impact of large-scale energy consumption. It addresses topics on fossil fuel, heat engines, solar energy, nuclear energy, energy conservation, transportation, air pollution and global effects. Concepts and quantitative analysis. (S)

87. Freshman Seminar in Physics and Astrophysics (1)
The Freshman Seminar Program is designed to provide new students with the opportunity to explore an intellectual topic with a faculty member in a small seminar setting. Freshman seminars are offered in all campus departments and undergraduate colleges, and topics vary from quarter to quarter. Enrollment is limited to fifteen to twenty students, with preference given to entering freshmen.

90. Undergraduate Seminar–Physics Today (1)
Undergraduate seminars organized around the research interests of various faculty members. *Prerequisite: none.* (F,W,S)

91. Undergraduate Seminar on Physics (1)
Undergraduate seminars organized around the research interests of various faculty members. (F,W,S)

99. Independent Study (2)
Independent reading or research on a topic by special arrangement with a faculty member. *(P/NP grading only.) Prerequisites: lower-division standing. Completion of thirty units at UCSD undergraduate study, a minimum UCSD GPA of 3.0, and a completed and approved "Special Studies" form. Department stamp required.*

UPPER-DIVISION

100A. Electromagnetism (4)
Coulomb's law, electric fields, electrostatics; conductors and dielectrics; steady currents, elements of circuit theory. Four hours lecture. *Prerequisites: Physics 2C or 4D, Mathematics 20D; 20E, 20F.* (Concurrent enrollment in Math. 20F permitted.) (F)

100B. Electromagnetism (4)
Magnetic fields and magnetostatics, magnetic materials, induction, AC circuits, displacement currents; development of Maxwell's equations. Four hours lecture. *Prerequisite: Physics 100A.* (W)

100C. Electromagnetism (4)
Electromagnetic waves, radiation theory; application to optics; motion of charged particles in electromagnetic fields; relation of electromagnetism to relativistic concepts. Four hours lecture. *Prerequisite: Physics 100B.* (S)

105A. Mathematical and Computational Physics (4)
A combined analytic and mathematica-based numerical approach to the solution of common applied mathematics problems in physics and engineering. Topics: Fourier series and integrals, special functions, initial and boundary value problems, Green's functions; heat, Laplace and wave equations. *Prerequisites: Mathematics 20E and 20F and Physics 4E or 2D.* (F)

105B. Mathematical and Computational Physics (4)
A continuation of Physics 105A covering selected advanced topics in applied mathematical and numerical methods. Topics include statistics, diffusion and Monte-Carlo simulations; Laplace equation and numerical methods for nonseparable geometries; waves in inhomogeneous media, WKB analysis; nonlinear systems and chaos. *Prerequisite: Physics 105A.* (W)

107/207. Macromolecule Structure Determination by X-ray Crystallography (4)
This course will describe the different steps used in solving for a three dimensional structure of a macromolecule using X-ray crystallography. Topics covered: theory of X-ray diffraction by a crystal; X-ray sources & detectors; crystallization of a protein; crystal symmetry; solution of phase problem by the isomorphous replacement method; anomalous scattering; molecular replacement method; model building and phase improvement; structure refinement. *Prerequisites: Mathematics 20D and Physics 100A, or BIBC 100 or Chemistry 114A or consent of instructor.* (F) (Not offered in 2004–2005)

110A. Mechanics (4)
Coordinate transformations, review of Newtonian mechanics, linear oscillations, gravitation, calculus of variations, Hamilton's principle, Lagrangian dynamics, Hamilton's equations, central force motion. Four hours lecture. *Prerequisites: Physics 2C or 4D, Mathematics 20D, 20E, 20F (concurrent enrollment in Mathematics 20F permitted).* (F)

110B. Mechanics (4)
Noninertial reference systems, dynamics of rigid bodies, coupled oscillators, special relativity, continuous systems. *Prerequisites: Physics 110A and Mathematics 20E.* (W)

120A-B. Physical Measurements (4-4)
A laboratory-lecture course in physical measurements with an emphasis on electronic methods. Topics include circuit theory, special circuits. Fourier analysis, noise, transmission lines, transistor theory, amplifiers, feedback, operational amplifiers, oscillators, pulse circuits, digital electronics. Three hours lecture, four hours laboratory. *Prerequisites: Physics 2CL and 2DL, Physics 100A.* (S,F) Course materials fee is required.

121. Experimental Techniques (4)
A laboratory-lecture course on the performance of scientific experiments with an emphasis on the use of microcomputers for control and data handling. Topics include microcomputer-architecture, interfacing, and programming, digital to analog and analog to digital

conversion, asynchronous buses, interrupt and control techniques, transducers, actuators, digital signal processing–signal filtering, deconvolution, averaging and detection, construction techniques–soldering, parts selection, assembly methods, project management–planning, funding, scheduling, and utilization of personnel. Three hours lecture, four hours laboratory. *Prerequisite: Physics 120A or equivalent.* (W) Course materials fee is required.

122/222. Experimental Foundation of Particle Physics (4–4)
Modern experimental techniques in particle physics will be discussed. Experiments are selected which have provided (or will shortly provide) tests of the theory of elementary particles. Examples of topics for which experiments are discussed include neutral currents, discovery of the J/Psi and Upsilon particle, number of light neutrino species, neutrino mass, CP violation and Higgs Searches. *Prerequisite: Physics 130B or Physics 215B.* (Not offered in 2004–2005)

130A. Quantum Physics (4)
Phenomena which led to the development of quantum mechanics. Wave mechanics; the Schrπdinger equation, interpretation of the wave function, the uncertainty principle, piece-wise constant potentials, simple harmonic oscillator, central field and the hydrogen atom. Observables and measurements. Four hours lecture. *Prerequisites: Physics 2C or 2D, 4E, or equivalent.* (S)

130B. Quantum Physics (4)
Matrix mechanics, angular momentum and spin, Stern-Gerlach experiments, dynamics of two-state systems, approximation methods, the complete hydrogen spectrum, identical particles. Four hours lecture. *Prerequisite: Physics 130A.* (F)

130C. Quantum Physics (4)
Scattering theory, symmetry and conservation laws, systems of interacting particles, interaction of electromagnetic radiation with matter, Fermi golden rule, the relativistic electron. *Prerequisites: Physics 100C or equivalent, 130B.* (W)

133/219. Condensed Matter/Materials Science Laboratory (4)
A project-oriented laboratory course utilizing state-of-the-art experimental techniques in materials science. The course prepares students for research in a modern condensed matter-materials science laboratory. Under supervision, the students develop their own experimental ideas after investigating current research literature. With the use of sophisticated state-of- the-art instrumentation students conduct research, write a research paper, and make verbal presentations. *Prerequisites: Physics 2CL and 2DL for undergraduates; Physics 152A or Physics 211A for graduate students.* (S) Course materials fee is required.

137. String Theory (4)
Quantum mechanics and gravity. Electromagnetism from gravity and extra dimensions. Unification of forces. Quantum black holes. Properties of strings and branes. *Prerequisites: Physics 100A and 110A or consent of instructor, Physics 130A may be taken concurrently.* (S) (Not offered in 2004–2005.)

140A. Statistical and Thermal Physics (4)
Integrated treatment of thermodynamics and statistical mechanics; statistical treatment of entropy, review of elementary probability theory, canonical distribution, partition function, free energy, phase equilibrium, introduction to ideal quantum gases. *Prerequisites: Physics 130A, or consent of instructor.* (F)

140B. Statistical and Thermal Physics (4)
Applications of the theory of ideal quantum gases in condensed matter physics, nuclear physics and astrophysics; advanced thermodynamics, the third law, chemical equilibrium, low temperature physics; kinetic theory and transport in non-equilibrium systems; introduction to critical phenomena including mean field theory. *Prerequisites: Physics 140A, or consent of instructor.* (W)

141. Computational Physics I: Probabilistic Models and Simulations (4)
Project-based computational physics laboratory course with student's choice of Fortran90/95, or C/C++. Applications from materials science to the structure of the early universe are chosen from molecular dynamics, classical and quantum Monte Carlo methods, physical Langevin/Fokker-Planck processes, and other modern topics. *Prerequisite: upper-division standing or consent of instructor.*

142. Computational Physics II: PDE and Matrix Models (4)
Project-based computational physics laboratory course for modern physics and engineering problems with student's choice of Fortran90/95, or C/C++. Applications of finite element PDE models are chosen from quantum mechanics and nanodevices, fluid dynamics, electromagnetism, materials physics, and other modern topics. *Prerequisite: upper-division standing or consent of instructor.* (S)

151. Elementary Plasma Physics (4)
Particle motions, plasmas as fluids, waves, diffusion, equilibrium and stability, nonlinear effects, controlled fusion. Three hours lecture. *Prerequisites: Math 21D or consent of instructor. Physics 100 (B,C) or ECE 107 and Physics 110A are suggested.* Cross listed with MAE 117A. (S) (Not offered in 2004–2005.)

152A. Condensed Matter Physics (4)
Physics of the solid state. Binding mechanisms, crystal structures and symmetries, diffraction, reciprocal space, phonons, free and nearly free electron models, energy bands, solid state thermodynamics, kinetic theory and transport, semiconductors. *Prerequisites: Physics 130A or Chemistry 133, and Physics 140A.* (W)

152B. Electronic Materials (4)
Physics of electronic materials. Semiconductors: bands, donors and acceptors, devices. Metals: Fermi surface, screening, optical properties. Insulators: dia-/ferro-electrics, displacive transitions. Magnets: dia-/para-/ferro-/antiferro-magnetism, phase transitions, low temperature properties. Superconductors: pairing, Meissner effect, flux quantization, BCS theory. *Prerequisite: Physics 152A or consent of instructor.* (S)

154. Nuclear and Particle Physics (4)
The strong, electromagnetic and weak interactions of elementary particles at high energies. Symmetries and conservation laws. Introduction to the calculation of particle decay widths and scattering cross-sections using Feynman diagrams. Relativistic equations of motion, including the Dirac equation. *Prerequisites: Physics 130B.*

155. Nonlinear Dynamics (4)
Qualitative aspects of Hamiltonian and dissipative dynamical systems: stability of orbits, integrability of Hamiltonian systems, chaos and nonperiodic motion, transition to chaos. Examples to be drawn from mechanics, fluid mechanics, and related physical systems. Numerical work and graphical display and interpretation will be emphasized. Three hours lecture. *Prerequisites: Physics 100B and 110B.* (S)

160. Stellar Astrophysics (4)
Introduction to stellar astrophysics: observational properties of stars, solar physics, radiation and energy transport in stars, stellar spectroscopy, nuclear processes in stars, stellar structure and evolution, degenerate matter and compact stellar objects, supernovae and nucleosynthesis. Physics 160, 161, and 162 may be taken as a three-quarter sequence for students interested in pursuing graduate study in astrophysics or individually as topics of interest. *Prerequisite: Physics 2 or 4 sequence or equivalent.* (F)

161. Black Holes and The Milky Way Galaxy (4)
The structure and content of the Milky Way galaxy and the physics of black holes. Topics will be selected from: general relativity, theory and observation of black holes, galactic x-ray sources, galactic structure, physical processes in the interstellar medium, star formation. Physics 160, 161, and 162 may be taken as a three-quarter sequence for students interested in pursuing graduate study in astrophysics or individually as topics of interest. *Prerequisites: Physics 2 or 4 sequence or equivalent.* (W)

162. Galaxies and Cosmology (4)
The structure and properties of galaxies, galaxy dynamics and dark matter, the expanding universe, plus some of the following topics: the big bang, early universe, galaxy formation and evolution, large scale structure, active galaxies and quasars. Physics 160, 161, and 162 may be taken as a three-quarter sequence for students interested in pursuing graduate study in astrophysics or individually as topics of interest. *Prerequisites: Physics 2 or 4 sequence or equivalent.* (S)

163. Exploring the Solar System (4)
Topics will include: the early solar system, and planetary formation; an introduction to the Sun and planets; the solar wind and its interaction with planets; spacecraft instruments and observations; the search for life in the solar system; and the search for planets outside our solar system. *Prerequisites: Physics 2A-B or Physics 4A-4C.* (F)) (Not offered in 2004-2005)

171/271. Biophysics of Neurons and Networks (4-4)
Fundamental limits to measurements on nervous systems, the biophysics of excitable membranes and neurons, and the fundamentals of recurrent neuronal networks. The emphasis is on information processing by the nervous system through physical reasoning and mathematical anaylsis. Three hours lecture. The graduate version, Physics 271, will include a report at the level of a research proposal. *Prerequisites: Physics 100A and 110A, BILD 1, Chemistry 6C and Physics 140A, for graduate students, consent of instructor.* The graduate version, Physics 271, will include a report at the level of a research proposal. (F)

172/272. Biophysics of Molecules (4-4)
Physical concepts and techniques used to study the structure and function of biological molecules, the thermodynamics and kinetics of biological activity, and physical descriptions of biological processes. Examples from enzyme action, protein folding, photobiology, and molecular motors. Three hours lecture. *Prerequisites: Physics 100A and 110A, BILD 1, Chemistry 6C and Physics 130A; and graduate students, consent of instructor.* The graduate version, Physics 272, will include a report at the level of a research proposal. (W)

173. Modern Physics Laboratory: Biological and Quantum Physics (4)
A selection of experiments in contemporary physics and biophysics. Students select among pulsed NMR, Mossbauer, Zeeman effect, light scattering, holography, optical trapping, voltage clamp and genetic transcription of ion channels in oocytes, flourescent imaging, and flight control in flies. *Prerequisites: Physics 120A, BILD 1 and Chemistry 6BL.* (S)

180/280. Teaching and Learning Physics (4)
How people learn and understand key concepts in physics. Readings in physics, physics education research, and cognitive science. Field work teaching and evaluating pre-college and college students. Useful for students interested in teaching and learning physical sciences. *Prerequisites: Physics 1, 2, or 4 series, or consent of instructor.*

191. Undergraduate Seminar on Physics (1)
Undergraduate seminars organized around the research interests of various faculty members. *Prerequisite: Physics 2A or 4A series.*

195. Physics Instruction (2-4)
Students will be responsible for and teach a class section of a lower-division physics course. They will also attend a weekly meeting on teaching methods and materials conducted by the professor who supervises their teaching. (P/NP grades only.) *Prerequisite: consent of instructor.* (F,W,S)

197. Physics Internship (4)
An enrichment program which provides work experience with industry, government offices, etc., under the supervision of a faculty member and industrial supervisor. *Prerequisite: Completion of 90 units with 2.5 GPA and consent of faculty adviser.*

198. Directed Group Study (2 or 4)
Directed group study on a topic or in a field not included in the regular departmental curriculum. (P/NP grades only.) *Prerequisites: consent of instructor and departmental chair.* (F,W,S)

199. Research for Undergraduates (2 or 4)
Independent reading or research on a problem by special arrangement with a faculty member. (P/NP grades only.) *Prerequisites: consent of instructor and departmental chair.* (F,W,S)

199H. Honors Thesis Research for Undergraduates (2-4)
Honors thesis research for seniors participating in the Honors Program. Research is conducted under the supervision of a physics faculty member. *Prerequisite: admission to the Honors Program in physics.* (F,W,S)

GRADUATE

200A. Theoretical Mechanics (4)
Lagrange's equations and Hamilton's principle; symmetry and constants of the motion. Applications to: charged particle motion; central forces and scattering theory; small oscillations; anharmonic oscillations; rigid body motion; continuum mechanics. *Prerequisite: Physics 110B or equivalent.* (F)

200B. Theoretical Mechanics (4)
Hamilton's equations, canonical transformations; Hamilton-Jacobi theory; action-angle variables and adiabatic invariants; introduction to canonical perturbation theory, nonintegrable systems and chaos; Liouville equation; ergodicity and mixing; entropy; statistical ensembles. *Prerequisite: Physics 200A.* (W)

201. Mathematical Physics (5)
An introduction to mathematical methods used in theoretical physics. Topics include: a review of complex variable theory, applications of the Cauchy residue theorem, asymptotic series, method of steepest descent, Fourier and Laplace transforms, series solutions for ODE's and related special functions, Sturm Liouville theory, variational principles, boundary value problems, and Green's function techniques. (F)

203A. Advanced Classical Electrodynamics (5)
Electrostatics, symmetries of Laplace's equation and methods for solution, boundary value problems, electrostatics in macroscopic media, magnetostatics, Maxwell's equations, Green functions for Maxwell's equations, plane wave solutions, plane waves in macroscopic media. *Prerequisite: Physics 100C or equivalent.* (W)

203B. Advanced Classical Electrodynamics (4)
Special theory of relativity, covariant formulation of electrodynamics, radiation from current distributions and accelerated charges, multipole radiation fields, waveguides and resonant cavities. *Prerequisite: Physics 203A.* (S)

206. Topics in Biophysics and Physical Biochemistry (4)
(Same as BGGN 206, Chemistry 206.) Selection of topics of current interest. Examples: primary processes of photosynthesis; membrane biophysics; applications of physical methods to problems in biology and chemistry, e.g., magnetic resonance, X-ray diffraction, fluctuation spectroscopy, optical techniques (fluorescence, optical rotary dispersion, circular dichroism). Topics may vary from year to year. *Prerequisite: consent of instructor.* (W)

107/207. Macromolecule Structure Determination by X-ray Crystallography (4)
This course will describe the different steps used in solving for a three-dimensional structure of a macromolecule using X-ray crystallography. Topics covered: theory of X-ray diffraction by a crystal; X-ray sources & detectors; crystallization of a protein; crystal symmetry; solution of phase problem by the isomorphous replacement method; anomalous scattering; molecular replacement method; model building and phase improvement; structure refinement. *Prerequisites: Mathematics 20D, Physics 100A, or BIBC 100 or Chemistry 114A or consent of instructor.* (F) (Not offered in 2004-2005)

210A. Equilibrium Statistical Mechanics (4)
Approach to equilibrium: BBGKY hierarchy; Boltzmann equation; H-theorem. Ensemble theory; thermodynamic potentials. Quantum statistics; Bose condensation. Interacting systems: Cluster expansion; phase transition via mean-field theory; the Ginzburg criterion. *Prerequisites: Physics 140A-B, 152A, 200A-B, or equivalent; concurrent enrollment in Physics 212C.* (S)

210B. Nonequilibrium Statistical Mechanics (4)
Transport phenomena; kinetic theory and the Chapman-Enskog method; hydrodynamic theory; nonlinear effects and the mode coupling method. Stochastic processes; Langevin and Focker-Planck equation; fluctuation-dissipation relation; multiplicative processes; dynamic field theory; Martin-Siggia-Rose formalism; dynamical scaling theory. *Prerequisite: Physics 210A.* (F)

210C. Statistical Field Theory (4)
Phase transition and critical phenomena: Landau-Ginzburg model and statistical field theory; Goldstone modes; breakdown of mean-field theory. Universality; scaling theory; the renormalization group. Epsilon expansion; large-N expansion; the nonlinear-sigma model. Topological defects; duality; the Kosterlitz-Thouless transition. *Prerequisite: Physics 210A or consent of instructor.* (W)

211A. Solid-State Physics (5)
The first of a two-quarter course in solid-state physics. Covers a range of solid-state phenomena that can be understood within an independent particle description. Topics include: chemical versus band-theoretical description of solids, electronic band structure calculation, lattice dynamics, transport phenomena and electrodynamics in metals, optical properties, semiconductor physics. *Prerequisite: Physics 152A or equivalent.* (F)

211B. Solid-State Physics (4)
Continuation of 211A. Deals with collective effects in solids arising from interactions between constituents. Topics include electron-electron and electron-phonon interactions, screening, band structure effects, Landau Fermi liquid theory. Magnetism in metals and insulators, superconductivity; occurrence, phenomenology, and microscopic theory. *Prerequisites: Physics 210A, 211A.* (offered in alternate years) (W)

212A. Quantum Mechanics (4)
Hilbert space formulation of quantum mechanics and application to simple systems: states and observables, uncertainty relations and measurements, time evolution, and mixed states and density matrix. Symmetries: commuting observables and symmetries, rotation group representations, Clebsh-Gordon coefficients, Wigner-Eckhardt theorem, and discrete symmetries (parity, time reversal, etc.). *Prerequisite: Physics 130B or equivalent.* (F)

212B. Quantum Mechanics (4)
Time independent perturbation theory: non-degenerate and degenerate cases, Zeeman effect, fine structure, exclusion principle, and many-electron atoms. Time dependent perturbation theory: interaction picture and Dyson series, transition rates. Radiation theory: quantization of EM field, calculation of atomic level transition rates, line width, and spontaneous decay. *Prerequisite: Physics 212A.* (W)

212C. Quantum Mechanics (4)
Scattering theory: Lippman-Schwinger formalism, Born approximation, partial waves, inelastic processes, and spin dependence. Path integrals: introductions and simple examples, rigid rotator, and Bohm-Aharonov effect. Dirac equation: single particle equation, hydrogen atom, and holes. *Prerequisites: Physics 212A-B.* (S)

214. Physics of Elementary Particles (4)
Classification of particles using symmetries and invariance principles, quarks and leptons, quantum electrodynamics, weak interactions, e-p interactions, deep-inelastic lepton-nucleon scattering, pp collisions, introduction to QCD. *Prerequisite: Physics 215A.* (W)

215A. Particles and Fields (4)
The first quarter of a three-quarter course on field theory and elementary particle physics. Topics covered include the relation between symmetries and conservation laws, the calculation of cross sections and reaction rates, covariant perturbation theory, and quantum electrodynamics. (F)

215B. Particles and Fields (4)
Continuation of 215A. Gauge theory quantization by means of path integrals, SU(3) symmetry and the

quark model, spontaneous symmetry breakdown, introduction to QCD and the Glashow-Weinberg-Salam model of weak interactions, basic issues of renormalization. *Prerequisite: Physics 215A.* (W)

215C. Particles and Fields (4)
Modern applications of the renormalization group in quantum chromodynamics and the weak interactions. Unified gauge theories, particle cosmology, and special topics in particle theory. *Prerequisites: Physics 215A-B.* (offered in alternate years) (S)

217. Field Theory and the Renormalization Group (4)
Application of field theory techniques and the renormalization group method to problems in condensed matter or particle physics. Topics will vary and may include: spin-glass and other systems dominated by quenched disorders; polymer statistics and liquid crystals; bosonization and many-body quantum systems in 1+1 dimensions; quantum chromodynamics and the electroweak model. *Prerequisites: Physics 210C, 212C, or consent of instructor.* (offered in alternate years) (S)

218A. Plasma Physics (4)
The basic physics of plasmas is discussed for the simple case of an unmagnetized plasma. Topics include: thermal equilibrium statistical properties, fluid and Landau theory of electron and ion plasma waves, velocity space instabilities, quasi-linear theory, fluctuations, scattering or radiation, Fokker-Planck equation. (F)

218B. Plasma Physics (4)
This course deals with magnetized plasma. Topics include: Appleton-Hartree theory of waves in cold plasma, waves in warm plasma (Bernstein waves, cyclotron damping). MHD equations, MHD waves, low frequency modes, and the adiabatic theory of particle orbits. *Prerequisite: Physics 218A.* (W)

218C. Plasma Physics (4)
This course deals with the physics of confined plasmas with particular relevance to controlled fusion. Topics include: topology of magnetic fields, confined plasma equilibria, energy principles, ballooning and kink instabilities, resistive MHD modes (tearing, rippling and pressure-driven), gyrokinetic theory, microinstabilities and anomalous transport, and laser-plasma interactions relevant to inertial fusion. *Prerequisite: Physics 218B.* (S)

133/219. Condensed Matter/Materials Science Laboratory (4)
A project-oriented laboratory course utilizing state-of-the-art experimental techniques in materials science. The course prepares students for research in a modern condensed matter-materials science laboratory. Under supervision, the students develop their own experimental ideas after investigating current research literature. With the use of sophisticated state-of-the-art instrumentation students conduct research, write a research paper, and make verbal presentations. Prerequisites: *Physics 2CL and 2DL for undergraduates; Physics 152A or Physics 211A for graduate students. (S)*

220. Group Theoretical Methods in Physics (4)
Study of group theoretical methods with applications to problems in high energy, atomic, and condensed matter physics. Representation theory, tensor methods, Clebsh-Gordan series. Young tableaux. The course will cover discrete groups, Lie groups and Lie algebras, with emphasis on permutation, orthogonal, and unitary groups. *Prerequisite: Physics 212C.* (S)

221A. Nonlinear and Nonequilibrium Dynamics of Physical Systems (4)
An introduction to the modern theory of dynamical systems and applications thereof. Topics include maps and flows, bifurcation theory and normal form analysis, chaotic attractors in dissipative systems, Hamiltonian dynamics and the KAM theorem, and time series analysis. Examples from real physical systems will be stressed throughout. *Prerequisite: Physics 200B.* (offered in alternate years) (W)

221B. Nonlinear and Nonequilibrium Dynamics of Physical Systems (4)
Nonlinear dynamics in spatially extended systems. Material to be covered includes fluid mechanical instabilities, the amplitude equation approach to pattern formation, reaction-diffusion dynamics, integrable systems and solitons, and an introduction to coherent structures and spatio-temporal chaos. *Prerequisites: Physics 210B and 221A.* (offered in alternate years) (S)

122/222. Experimental Foundation of Particle Physics (4–4)
Modern experimental techniques in particle physics will be discussed. Experiments are selected which have provided (or will shortly provide) tests of the theory of elementary particles. Examples of topics for which experiments are discussed include neutral currents, discovery of the J/Psi and Upsilon particle, number of light neutrino species, neutrino mass, CP violation and Higgs searches. *Prerequisite: Physics 130B or Physics 215B.*

223. Stellar Structure and Evolution (4)
Energy generation, flow, hydrostatic equilibrium, equation of state. Dependence of stellar parameters (central surface temperature, radius, luminosity, etc.) on stellar mass and relation to physical constants. Relationship of these parameters to the H-R diagram and stellar evolution. Stellar interiors, opacity sources, radiative and convective energy flow. Nuclear reactions, neutrino processes. Polytropic models. White dwarfs and neutron stars. *Prerequisites: Physics 130C or equivalent, Physics 140A-B or equivalent.* (S/U grades permitted.) (offered in alternate years) (F)

224. Physics of the Interstellar Medium (4)
Gaseous nebulae, molecular clouds, ionized regions, and dust. Low energy processes in neutral and ionized gases. Interaction of matter with radiation, emission and absorption processes, formation of atomic lines. Energy balance, steady state temperatures, and the physics and properties of dust. Masers and molecular line emission. Dynamics and shocks in the interstellar medium. *Prerequisites: Physics 130A-B or equivalent, Physics 140A-B or equivalent.* (S/U grades permitted.) (offered in alternate years)

225A-B. General Relativity (4-4)
This is a two-quarter course on gravitation and the general theory of relativity. The first quarter is intended to be offered every year and may be taken independently of the second quarter. The second quarter will be offered in alternate years. Topics covered in the first quarter include special relativity, differential geometry, the equivalence principle, the Einstein field equations, and experimental and observational tests of gravitation theories. The second quarter will focus on more advanced topics, including gravitational collapse, Schwarzschild and Kerr geometries, black holes, gravitational radiation, cosmology, and quantum gravitation. (225B offered in alternate years) (F,W)

226. Galaxies and Galactic Dynamics (4)
The structure and dynamics of galaxies. Topics include potential theory, the theory of stellar orbits, self-consistent equilibria of stellar systems, stability and dynamics of stellar systems including relaxation and approach to equilibrium. Collisions between galaxies, galactic evolution, dark matter, and galaxy formation. *Prerequisite: consent of instructor.* (offered in alternate years)

227. Cosmology (4)
An advanced survey of topics in physical cosmology. The Friedmann models and the large-scale structure of the universe, including the observational determination of H_0 (the Hubble constant) and q_0 (the deceleration parameter). Galaxy number counts. A systematic exposition of the physics of the early universe, including vacuum phase transitions; inflation; the generation of net baryon number, fluctuations, topological defects and textures. Primordial nucleosynthesis, both standard and nonstandard models. Growth and decay of adiabatic and isocurvature density fluctuations. Discussion of dark matter candidates and constraints from observation and experiment. Nucleocosmochronology and the determination of the age of the universe. *Prerequisite: consent of instructor.* (offered in alternate years)

228. High-Energy Astrophysics and Compact Objects (4)
The physics of compact objects, including the equation of state of dense matter and stellar stability theory. Maximum mass of neutron stars, white dwarfs, and super-massive objects. Black holes and accretion disks. Compact x-ray sources and transient phenomena, including x-ray and γ-ray bursts. The fundamental physics of electromagnetic radiation mechanisms: synchrotron radiation, Compton scattering, thermal and nonthermal bremsstrahlung, pair production, pulsars. particle acceleration models, neutrino production and energy loss mechanisms, supernovae, and neutron star production. *Prerequisites: Physics 130A-B-C or equivalent.* (offered in alternate years)

230. Advanced Solid-State Physics (1-4)
Selection of advanced topics in solid-state physics; material covered may vary from year to year. Examples of topics covered: disordered systems, surface physics, strong-coupling superconductivity, quantum Hall effect, low-dimensional solids, heavy fermion systems, high-temperature superconductivity, solid and liquid helium. (Offered in alternate years.) *Prerequisite: Physics 211B.*

152B/232. Electronic Materials (4)
Physics of electronic materials. Semiconductors: bands, donors and acceptors, devices. Metals: Fermi surface, screening, optical properties. Insulators: dia-/ferro-electrics, displacive transitions. Magnets: dia-/para-/ferro-/antiferro-magnetism, phase transitions, low temperature properties. Superconductors: pairing, Meissner effect, flux quantization, BCS theory. *Prerequisites: Physics 152A, Phys 211 or consent of instructor.* Graduate students in Phys 232 will complete a special topics paper. (S)

235. Nonlinear Plasma Theory (4)
This course deals with nonlinear phenomena in plasmas. Topics include: orbit perturbation theory, stochasticity, Arnold diffusion, nonlinear wave-particle and wave-wave interaction, resonance broadening, basics of fluid and plasma turbulence, closure methods, models of coherent structures. *Prerequisite: Physics 218C or consent of instructor.* (offered in alternate years) (W)

239. Special Topics (1–3)
From time to time a member of the regular faculty or a resident visitor will find it possible to give a self-contained short course on an advanced topic in his or

her special area of research. This course is not offered on a regular basis, but it is estimated that it will be given once each academic year. (S/U grades permitted.)

250. Condensed Matter Physics Seminar (0–1)
Discussion of current research in physics of the solid state and of other condensed matter. (S/U grades only.) (F,W,S)

251. High-Energy Physics Seminar (0–1)
Discussions of current research in nuclear physics, principally in the field of elementary particles. (S/U grades only.) (F,W,S)

252. Plasma Physics Seminar (0–1)
Discussions of recent research in plasma physics. (S/U grades only.) (F,W,S)

253. Astrophysics and Space Physics Seminar (0–1)
Discussions of recent research in astrophysics and space physics. (S/U grades only.) (F,W,S)

256. Biophysics Special Topics Seminar (0–1)
Discussions of current research in experimental solid state physics and biophysics. (S/U grades only.) (F,W,S)

257. High-Energy Physics Special Topics Seminar (0–1)
Discussions of current research in high-energy physics. (S/U grades only.) (F,W,S)

258. Astrophysics and Space Physics Special Topics Seminar (0–1)
Discussions of current research in astrophysics and space physics. (S/U grades only.) (F,W,S)

260. Physics Colloquium (0–1)
Discussions of recent research in physics directed to the entire physics community. (S/U grades only.) (F,W,S)

261. Seminar on Physics Research at UCSD (0–1)
Discussions of current research conducted by faculty members in the Department of Physics. (S/U grades only.) (W,S)

262. Complex Dynamical Systems Seminar (0–1)
Discussions of recent research in nonlinear and non-equilibrium physics. (S/U grades only.) (F,W,S)

265. Neuronal Networks Topics Seminar (1)
Discussion of current research on neuronal systems and dynamics. (F,W,S)

266. Recent Topics in Condensed Matter Physics (1–3)
The course is dedicated to recent developments in the area of condensed matter physics through lectures given by graduate students and postdocs. The course teaches practical skills, delivering research lectures, and answering questions in front of a research audience. *Prerequisite: physics graduate students in good standing.* (F,W,S)

171/271. Biophysics of Neurons and Networks (4–4)
Fundamental limits to measurements on nervous systems, the biophysics of excitable membranes and neurons, and the fundamentals of recurrent neuronal networks. The emphasis is on information processing by the nervous system through physical reasoning and mathematical anaylsis. Three hours lecture. The graduate version, Physics 271, will include a report at the level of a research proposal. *Prerequisites: Physics 100A and 110A, BILD 1, Chemistry 6C and Physics 140A, for graduate students, consent of instructor.* The graduate version, Physics 271, will include a report at the level of a research proposal. (W)

172/272. Biophysics of Molecules (4–4)
Physical concepts and techniques used to study the structure and function of biological molecules, the thermodynamics and kinetics of biological activity, and physical descriptions of biological processes. Examples from enzyme action, protein folding, photobiology, and molecular motors. Three hours lecture. *Prerequisites: Physics 100A and 110A, BILD 1, Chemistry 6C and Physics 130A and graduate students consent of instructor.* The graduate version, Physics 272, will include a report at the level of a research proposal. (S)

180/280. Teaching and Learning Physics (4)
How people learn and understand key concepts in physics. Readings in physics, physics education research, and cognitive science. Field work teaching and evaluating pre-college and college students. Useful for students interested in teaching and learning physical sciences. Undergraduate students are required to read and discuss papers in class. Graduate students are expected to read the papers and prepare an annotated bibliography on the background literature, then lead the in-class discussion on the topics covered in the papers. *Prerequisites: Physics 1, 2, or 4 series, or consent of instructor.*

295. M.S. Thesis Research in Materials Physics (1–12)
Directed research on M.S. dissertation topic. (F,W,S)

297. Special Studies in Physics (1–4)
Studies of special topics in physics under the direction of a faculty member. *Prerequisites: consent of instructor and departmental vice chair, education.* (S/U grades permitted.) (F,W,S)

298. Directed Study in Physics (1-12)
Research studies under the direction of a faculty member. (S/U grades permitted.) (F,W,S)

299. Thesis Research in Physics (1-12)
Directed research on dissertation topic. (F,W,S)

500. Instruction in Physics Teaching (1-4)
This course, designed for graduate students, includes discussion of teaching, techniques and materials necessary to teach physics courses. One meeting per week with course instructors, one meeting per week in an assigned recitation section, problem session, or laboratory section. Students are required to take a total of two units of Physics 500. (F,W,S)

Political Science

OFFICE: Social Science Building
polisci.ucsd.edu

Professors

Nathaniel L. Beck, Ph.D.
Amy B. Bridges, Ph.D.
Marsha A. Chandler, Ph.D., *Senior Vice Chancellor, Academic Affairs*
William M. Chandler, Ph.D.
Ellen T. Comisso, Ph.D.
Wayne A. Cornelius, Ph.D.
Gary W. Cox, Ph.D.
Paul W. Drake, Ph.D.
Steven P. Erie, Ph.D.
Peter A. Gourevitch, Ph.D.
Germaine A. Hoston, Ph.D.
Peter H. Irons, Ph.D., J.D.
Gary C. Jacobson, Ph.D.
Samuel H. Kernell, Ph.D.
David A. Lake, Ph.D., *Chair*
Sanford A. Lakoff, Ph.D., *Emeritus*
Arend Lijphart, Ph.D., *Emeritus*
David R. Mares, Ph.D.
Mathew D. McCubbins, Ph.D.
Samuel L. Popkin, Ph.D.
Peter H. Smith, Ph.D.
Kaare Strom, Ph.D.
Tracy B. Strong, Ph.D.

Associate Professors

J. Lawrence Broz, Ph.D.
Ann L. Craig, Ph.D.
Clark Gibson, Ph.D.
Alan C. Houston, Ph.D.
Victor V. Magagna, Ph.D., *Academic Senate Distinguished Teaching Award*
Philip G. Roeder, Ph.D., *Academic Senate Distinguished Teaching Award*

Assistant Professors

Jeeyang Baum, Ph.D.
Sean Farhang, Ph.D., *(Acting)*
Karen E. Ferree, Ph.D.
Fonna Forman-Barzilai, Ph.D.
Kristian S. Gleditsch, Ph.D.
Zoltan L. Hajnal, Ph.D.
Thaddeus Kousser, Ph.D.
Jeffrey Lax, Ph.D.
Branislav Slantchev, Ph.D.

Adjunct Professors

Peter F. Cowhey, Ph.D.
Harvey Goldman, Ph.D.
Stephan Haggard, Ph.D.
Daniel Hallin, Ph.D.
Miles Kahler, Ph.D.
Ellis Krauss, Ph.D.
Richard Kronick, Ph.D.
Susan L. Shirk, Ph.D.
Matthew Shugart, Ph.D.

Associate Adjunct Professor

Barbara Walter, Ph.D.

The Major Program

Political science addresses some of the fundamental problems facing human society. Questions concerning world peace, government policies aimed at achieving economic stability and growth, the management of environmental quality, control over political competition, the possibility of using law to affect social and political change, and the gap between the rich and poor in the U.S. and abroad are all on the research agenda of contemporary political scientists. The general purpose of the major is to address these and other issues systematically, and, simultaneously, to raise the broad theoretical questions which can help students relate today's political debates to those debates about politics which have kept a theoretical tradition alive for over 2,000 years.

Students may major in political science as a general program of study, or they may concentrate in one of six areas: (1) American politics, (2) comparative politics, (3) international relations, (4) political theory, (5) public law, and (6) public policy. All majors in political science must satisfy the following sixteen courses: PS 30 (Political Inquiry), three of the following four lower-division courses (Political Science 10, 11, 12 and 13) and twelve upper-division courses. Moreover, as stated below, students concentrating in one of the fields must satisfy that field's particular lower- and upper-division requirements.

Requirements for Major in Political Science without an Area of Concentration

1. Three of the four lower-division courses
2. Political Science 30
3. Any twelve upper-division political science courses

Requirements for Major in Political Science with an Area of Concentration

Major in Political Science/American Politics

1. Lower-division required: PS 10 (in addition to two other lower-division courses)
2. Political Science 30
3. Five upper-division American courses:
   A. at least two of which must be from the 100 sequence: 100A-B-C, 100DA, 100E-F-H
   B. the additional courses for the American concentration must be chosen from: 102C, 102E-F-G, 102J, 102K, 103A, 103B, 104A-B-C-D, 104F, 104I, 104L-M, 106A, 108

Major in Political Science/Comparative Politics

1. Lower-division required: PS 11 (in addition to two other lower-division courses)
2. Political Science 30
3. Five upper-division courses including:
   A. at least one from the following thematic courses: 120K, 124A-B, 125, 125A, 126AA, 126AC, 136A-B-C, 137A, 139A, 150A-B
   B. and at least one each from two of the following three regional areas:

      Asia: 121, 121B, 130B, 130H, 131C, 132B-C, 133A, 133D, 133DD, 133E-F

      Europe: 120A-B-C-D, 120H, 120I, 126AB, 130AA, 130AC

      Latin America: 134AA, 134B-C-D, 134N, 134R

Major in Political Science/ International Relations

1. Lower-division required: PS 12 (in addition to two other lower-division courses)
2. Political Science 30
3. Five upper-division IR courses with at least one each from three of the following four groups:
   A. Foreign Policy: 142A, 142B, 142M, 145A, 146A, 150A-B, 152
   B. National and International Security: 142I-J-K-L-M, 146E
   C. Political Economy: 126AB, 140A, 142B, 144AA, 144AB, 144D-E-F, 146A
   D. Theory of International Relations: 141A, 142L, 145B-C, 152

Major in Political Science/Political Theory

1. Three of four lower-division courses
2. Political Science 30
3. 110A-B-C
4. And at least two additional courses from: 110DA, 110EA, 110EB, 110H, 110J, 110N, 110T, 112A, 113B, 114B, 115A, 116A-B, 117, 118A-B, 119A

Major in Political Science/Public Law

1. Lower-division required: PS 10 (in addition to two other lower-division courses)
2. Political Science 30
3. Five of the following: 100A-B, 102L, 104A-B-C-D, 104F, 104I, 104L-M, 124B

Major in Political Science/Public Policy

1. Lower-division required: PS 10 (in addition to two other lower-division courses)
2. Political Science 30
3. 160AA
4. One of 160AB, 167A, 168, 170A
5. Two of 100A-B-C, 100E-F-G, 100I-J
6. One of 102B-C, 102E, 102L, 103A, 103B, 106A, 123A, 126AC, 142A, 142J, 150A-B, 161, 162, 163, 165, 166F

Two upper-division courses in a field may be substituted for that field's lower-division course. However, these courses cannot also be used to satisfy the upper-division course requirements for a concentration of that field.

Since course offerings may change from year to year, students are strongly advised to consult the department for the latest listing of courses before preregistration.

Agreements signed between UCSD and several community colleges allow students to apply some community college courses toward lower-division course requirements for the major. Transfer students must, however, take at least one of the lower-division courses (10, 11, 12, 13) in residence at UCSD. Courses taken elsewhere may be credited toward the major. Please check with an undergraduate student affairs adviser for more information on credit for courses taken elsewhere.

Students who pass the Advanced Placement (AP) Tests in American or Comparative Politics may petition to be exempted from taking PS 10 or 11 (respectively). Effective fall 2004, students must pass with a score of 5 to be exempted from taking PS 10 or 11.

At least nine courses in political science must be taken in residence at UCSD. A total maximum of six courses may be taken elsewhere and applied toward the major. This applies to transfer students, students who pass the AP exam(s),

as well as students who study abroad on the Education Abroad Program (EAP) or the Opportunities Abroad Program (OAP). Students planning to transfer course work completed elsewhere are urged to consult the undergraduate student affairs adviser.

Double majors who include political science as one of their two majors must fulfill the requirements of both programs. Please consult the undergraduate student affairs adviser for more information.

Students must maintain an overall 2.0 GPA in the major. To be counted toward satisfying the requirements for the major, upper- and lower-division courses must be completed with a C– or better grade. Courses taken to satisfy requirements for the major may not be taken Pass/No Pass with the exception of a maximum of two independent study courses (PS 199).

Honors candidates for departmental honors are required to take PS 191A and B in which they write a senior thesis. (A 3.5 GPA in the major, senior standing, a significant writing project, a recommendation from a political science faculty member, and a political science faculty adviser are currently prerequisites for honors.) These courses may be counted toward the upper-division requirement.

Effective fall 2004, to be admitted to the Honors Seminar a student must be of senior standing in the first quarter of the seminar, have a minimum GPA of 3.6 in political science, have completed all lower-division requirements including Political Science 30 and five upper-division courses. Also, students must have an adviser prior to enrolling in the Honors Seminar.

Career Guidance

The premise of our educational philosophy is that the best professional preparation for productive careers which we can provide is one which is broad, theoretical, and only indirectly related to the current job market. Our majors graduate into a wide range of career options.

Many political science majors at UCSD will seek admission to a *law school*. Although law schools make no recommendation concerning the usefulness of any undergraduate major, a B.A. in political science should be seen as a useful complement to a law degree. Students who take courses in American government, policy analysis, and law and politics find that they develop a keen understanding of the role of law in the general political process. This helps students understand the limits and possibilities of the legal process in fostering change or in preserving the status quo. This same curriculum provides a solid foundation for a career in *journalism*. Students with any specific questions regarding law are advised to consult with career services.

Increasingly, political science majors are preparing for careers in *business* or as *policy analysts* in both the public and private sectors. Many of these students pursue advanced degrees in public policy or study for a master's in business administration. Students interested in this option should look into public policy, American, or comparative politics as an area of concentration. Students interested in public policy might wish to consider the public policy minor, which is described separately in the catalog. Some political science majors are interested in careers in international organization or *diplomacy*. These students should look into international relations as an area of concentration. In addition, a broad array of courses in comparative politics is essential for anyone interested in a career of international service.

A political science major offers excellent preparation for teaching in the elementary schools. If you are interested in earning a California teaching credential from UCSD, contact the Teacher Education Program for information about the prerequisite and professional preparation requirements. It is recommended that you contact TEP as early as possible in your academic career.

Students interested in majoring or minoring in political science should stop by the Department of Political Science Office, SSB301, or visit our Web site: *www.polisci.ucsd.edu.*

Study Abroad

Political science majors are encouraged to participate in the Education Abroad Program (EAP) and to investigate other options for foreign study through the Opportunities Abroad Program (OAP). By petition, credits earned through them can fulfill UCSD degree and major requirements.

Minor in Political Science

For students entering UCSD winter 1998 or later the following guidelines for a political science minor will apply: seven political science courses, with a minimum of five upper-division. Continuing students may follow the guidelines for a minor of a total of six political science courses, with a minimum of three upper-division. All courses taken for a political science minor must be taken for a letter grade.

Interdisciplinary Minors

The Department of Political Science takes part in two interdisciplinary minors offered at UCSD. The law and society minor offers students the opportunity to examine the role of the legal system in society. Students should note that Law and Society 101 (Contemporary Legal Issues) may be used in fulfilling the twelve upper-division course requirement for the political science major. The minor in health care–social issues offers students a variety of perspectives that will enhance their ability to deal with complex social and ethical issues in modern health care. Additional information on these programs is available through the Warren Interdisciplinary Programs Office.

Research

The Department of Political Science is closely affiliated with several research centers/institutes/projects currently on campus. Faculty members directly involved include: Steven Erie, director, Urban Studies Program; J. Lawrence Broz and Kristian Gleditsch, coordinators, Project in International Affairs; Germaine Hoston, director, Center for TransPacific Studies in Values, Culture, and Politics; Mathew McCubbins, director, Public Policy Research Project; Samuel Kernell, coordinator, American Political Institutions Project; Peter Cowhey, director, Institute on Global Conflict and Cooperation; Wayne Cornelius, director, Center for U.S.-Mexican Studies; Peter Irons, director, Earl Warren Bill of Rights Project; Wayne Cornelius, director, Center for Comparative Immigration Studies. For further information please refer to the General Catalog section on "Research at UCSD."

The Ph.D. Program

The Department of Political Science at the University of California, San Diego offers a program of graduate studies leading to the Ph.D. degree. Instruction is provided in the major fields of the discipline. For purposes of comprehensive examinations, the discipline is broken into four fields: American politics, comparative politics,

international relations, and political theory. The department also offers a variety of courses that are of a methodological or epistemological nature, spanning the various fields.

Students take two years of course work in preparation for their comprehensive exams, including the First-Year Core Curriculum (POLI 200A-C and 204A-C). Students also attend regularly scheduled colloquia which feature presentations by faculty, outside speakers, and dissertation students.

A student must complete one seminar paper in one of his or her examination fields. This paper may be written as part of the requirements for a regularly scheduled seminar course or in an independent research course. The paper will involve original research or other creative effort.

By the end of the second year, a student must stand for the General Examination, which consists of written examinations in each of two fields and in a focus-area, and an oral examination.

The comprehensive exams are both written and oral. They test more than just mastery of course work and hence there is no single set of courses required for any field exam. To pass the exams a student is expected not only to master the relevant literature, but also to be able to synthesize and analyze the major issues in the field.

Each comprehensive exam tests both knowledge of the major theoretical approaches in the field and the ability to apply those theories to important questions in the field. For one of the two exam fields, the student also designates a specific area of interest (a "focus area"). The written focus area exam tests the student's in-depth knowledge and understanding. The focus area exam is taken the same week as the general field exam, and there is one oral covering both exams. Each field publishes a list of focus areas; students may, with approval, craft their own focus area. Each field, in addition, publishes a list of suggested ways to prepare for its exams; each field also determines the research tools required for scholars in that field.

Students are expected to complete their comprehensive exams no later than the end of their second year.

After passing both exams, students are expected to write a dissertation prospectus. This prospectus must be defended before a committee of five faculty, including two members outside the department. This committee also administers the final oral defense of the dissertation.

It is expected that students will complete their dissertations within six years of starting the program.

Students interested in the program should consult the department Web site for more detailed information.

Departmental Ph.D. Time Limit Policies

Students must be advanced to candidacy by the end of four years. Total university support cannot exceed seven years. Total registered time at UCSD cannot exceed eight years.

COURSES

LOWER-DIVISION

10. Introduction to Political Science: American Politics (4)
This course surveys the processes and institutions of American politics. Among the topics discussed are individual political attitudes and values, political participation, voting, parties, interest groups, Congress, presidency, Supreme Court, the federal bureaucracy, and domestic and foreign policy making.

11. Introduction to Political Science: Comparative Politics (4)
The nature of political authority, the experience of a social revolution, and the achievement of an economic transformation will be explored in the context of politics and government in a number of different countries.

12. Introduction to Political Science: International Relations (4)
The issues of war/peace, nationalism/internationalism, and economic growth/redistribution will be examined in both historical and theoretical perspectives.

13. Power and Justice (4)
An exploration of the relationship between power and justice in modern society. Materials include classic and contemporary texts, films and literature.

27. Ethics and Society (4)
An examination of ethical principles (e.g., utilitarianism, individual rights, etc.) and their social and political applications to contemporary issues such as abortion, environmental protection, and affirmative action). Ethical principles will also be applied to moral dilemmas familiar in government, law, business, and the professions. Satisfies the Warren College ethics and society requirement.

30. Political Inquiry (4)
Introduction to the logic of inference in social science and to quantitative analysis in political science and public policy including research design, data collection, data description and computer graphics, and the logic of statistical inference (including linear regression).

40. Introduction to Law and Society (4)
This course is designed as a broad introduction to the study of law as a social institution and its relations to other institutions in society. The focus will be less on the substance of law (legal doctrine and judicial opinions) than on the process of law–how legal rules both reflect and shape basic social values and their relation to social, political, and economic conflicts within society.

87. Freshman Seminar (1)
The Freshman Seminar Program is designed to provide new students with the opportunity to explore an intellectual topic with a faculty member in a small seminar setting. Freshman seminars are offered in all campus departments and undergraduate colleges, and topics vary from quarter to quarter. Enrollment is limited to 15 to 20 students, with preference given to entering freshmen. May not be used to fulfill any major or minor requirements in political science.

90. Undergraduate Seminar (1)
Selected topics to introduce students to current issues and trends in political science. May not be used to fulfill any major or minor requirements in political science.

UPPER-DIVISION

Minimum requirement for all upper-division courses is at least one quarter of lower-division political science, or upper-division standing.

American Politics

100A. The Presidency (4)
The role of the presidency in American politics. Topics will include nomination and election politics, relations with Congress, party leadership, presidential control of the bureaucracy, international political role, and presidential psychology.

100B. The U.S. Congress (4)
This course will examine the nomination and election of congressmen, constituent relationships, the development of the institution, formal and informal structures, leadership, comparisons of House with Senate, lobbying, and relationship with the executive branch.

100C. American Political Parties (4)
This course examines the development of the two major parties from 1789 to the present. Considers the nature of party coalitions, the role of leaders, activists, organizers, and voters, and the performance of parties in government.

100DA. Voting, Campaigning, and Elections (4)
A consideration of the nature of public opinion and voting in American government. Studies of voting behavior are examined from the viewpoints of both citizens and candidates, and attention is devoted to recent efforts to develop models of electoral behavior for the study of campaigns. The role of mass media and money also will be examined.

100E. Interest Group Politics (4)
The theory and practice of interest group politics in the United States. Theories of pluralism and collective action, the behavior and influence of lobbies, the role of political action committees, and other important aspects of group action in politics are examined. *Prerequisite: sophomore standing.*

100H. Race and Ethnicity in American Politics (4)
This course examines the processes by which racial and ethnic groups have/have not been incorporated into the American political system. The course focuses on the political experiences of European immigrant groups, blacks, Latinos, and Asians.

100J. Race in American Political Development (4)
Readings examine how the multiracial character of the United States has shaped the broad outlines of American politics. Cases include the founding/the Constitution, southern politics, social organization in formerly Mexican regions, the New Deal, consequences of limited suffrage.

102C. American Political Development (4)
Examines selected issues and moments in the political history of the United States, comparing competing explanations and analyses of U.S. politics. Likely topics include the founding, "American exceptionalism," change in the party system, race in U.S. politics, the "new institutionalism."

102E. Urban Politics (4)
(Same as USP107) This survey course focuses upon the following six topics: the evolution of urban politics since the mid-nineteenth century; the urban fiscal crisis; federal/urban relationships; the "new" ethnic politics; urban power structure and leadership; and selected contemporary policy issues such as downtown redevelopment, poverty, and race.

102F. Mass Media and Politics (4)
This course will explore both the role played by mass media in political institutions, processes and behaviors, and reciprocally, the roles played by political systems in guiding communication processes.

102G. Special Topics in American Politics (4)
An undergraduate course designed to cover various aspects of American politics.

102J. Advanced Topics in Urban Politics (4)
(Same as USP 110) Building upon the introductory urban politics course, the advanced topics course explores issues such as community power, minority empowerment, and the politics of growth. A research paper is required. Students wishing to fulfill the paper requirement with field research should enroll in the subsequent PS 102JJ course (offered Summer Session 2). *Prerequisite: consent of instructor.*

102JJ. Field Research in Urban Politics (2)
(Same as USP 111) To be taken with the approval of the PS 102J instructor, this course allows students to do original field research on topics in urban politics. This course is offered in Summer Session 2 subsequent to a 102J course. *Prerequisite: consent of instructor.* May not be used to fulfill any major or minor requirements in Political Science.

103A. California Government and Politics (4)
(Same as USP 109) This survey course explores six topics: 1) the state's political history; 2) campaigning, the mass media, and elections; 3) actors and institutions in the making of state policy; 4) local government; 5) contemporary policy issues; e.g., Proposition 13, school desegregation, crime, housing and land use, transportation, water; 6) California's role in national politics.

103B. Politics and Policymaking in Los Angeles (4)
(Same as USP 113) This course examines politics and policymaking in the five-county Los Angeles region. It explores the historical development of the city, suburbs, and region; politics, power, and governance; and major policy challenges facing the city and metropolitan area. *Prerequisite: upper-division standing.*

104A. The Supreme Court and the Constitution (4)
An introduction to the study of the Supreme Court and constitutional doctrine. Topics will include the nature of judicial review, federalism, race, and equal protection. The relation of judicial and legislative power will also be examined.

104B. Civil Liberties—Fundamental Rights (4)
This course will examine issues of civil liberties from both legal and political perspectives. Topics will include the First Amendment rights of speech, press, assembly, and religion; other "fundamental" rights, such as the right to privacy; and some issues in equal protection. Conflicts between governmental powers and individual rights will be examined.

104C. Civil Liberties—The Rights of Criminals and Minorities (4)
Examines the legal issues surrounding the rights of "marginal" groups such as aliens, illegal immigrants, and the mentally ill. Also includes a discussion of the nature of discrimination in American society.

104D. Judicial Politics (4)
Introduction to the study of law and courts as political institutions and judges as political actors, including the role of the judiciary in our constitutional system and decision making both within the Supreme Court and within the judicial hierarchy.

104F. Seminar in Constitutional Law (4)
This seminar will provide an intensive examination of a major issue in constitutional law, with topics varying from year to year. Recent topics have included equal protection law and the rights of civilians in wartime. Students will be required to do legal research on a topic, write a legal brief, and argue a case to the seminar. *Prerequisites: PS 104A/B; department stamp.*

104I. Law and Politics—Courts and Political Controversy (4)
This course will examine the role of the courts in dealing with issues of great political controversy, with attention to the rights of speech and assembly during wartime, questions of internal security, and the expression of controversial views on race and religion. The conflict between opposing Supreme Court doctrines on these issues will be explored in the context of the case studies drawn from different historical periods.

104L. Positive Political Theory of Law (4)
We will discuss modern theories of the origins of law and legal behavior.

106A. Politics and Bureaucracy (4)
This course explores the problematic relationships between politics and bureaucracy. The theoretical perspectives of Weber, the marxists, and pluralists will be employed to understand the character of American bureaucratic development in the twentieth century. *Prerequisite: upper-division standing.*

108. Politics of Multiculturalism (4)
This course will examine central issues in debates about race, ethnicity, and multiculturalism in the United States. It will look at relations not only between whites and minorities, but also at those among racial and ethnic communities.

Political Theory

110A. Citizens and Saints: Political Thought from Plato to Augustine (4)
This course focuses on the development of politics and political thought in ancient Greece, its evolution through Rome and the rise of Christianity. Readings from Plato, Aristotle, Augustine, Machiavelli, and others.

110B. Sovereigns, Subjects, and the Modern State: Political Thought from Machiavelli to Rousseau (4)
The course deals with the period which marks the rise and triumph of the modern state. Central topics include the gradual emergence of human rights and the belief in individual autonomy. Readings from Machiavelli, Hobbes, Locke, Rousseau, and others.

110C. Revolution and Reaction: Political Thought from Kant to Nietzsche (4)
The course deals with the period which marks the triumph and critique of the modern state. Central topics include the development of the idea of class, of the irrational, of the unconscious, and of rationalized authority as they affect politics. Readings drawn from Rousseau, Kant, Hegel, Marx, Nietzsche, and others.

110DA. Freedom and Discipline: Political Thought in the Twentieth Century (4)
This course addresses certain problems which are characteristic of the political experience of the twentieth century. Topics considered are revolution, availability of tradition, and the problems of the rationalization of social and political relations. Readings from Nietzsche, Weber, Freud, Lenin, Gramsci, Dewey, Oakeshott, Arendt, Merleau-Ponty.

110EA. American Political Thought from Revolution to Civil War (4)
The first quarter examines the origins and development of American political thought from the revolutionary period to the end of the nineteenth century with special emphasis on the formative role of eighteenth-century liberalism and the tensions between "progressive" and "conservative" wings of the liberal consensus.

110EB. American Political Thought from Civil War to Civil Rights (4)
The second quarter examines some of the major themes of American political thought in the twentieth century including controversies over the meaning of democracy, equality, and distributive justice, the nature of "neoconservatism," and America's role as a world power.

110EC. American Political Thought: Contemporary Debates (4)
This course explores contemporary issues in American political thought. Topics may include liberalism and rights, gender and sexuality, race and ethnicity, cultural diversity, and the boundaries of modern citizenship. Readings include political pamphlets, philosophical treatises, court decisions, and works of literature.

110H. Democracy and Its Critics (4)
This course will examine the historical development of the ideal of democracy from Periclean Athens to the present in the light of criticism by such thinkers as Plato, Tocqueville, and Mosca and difficulties encountered in efforts to realize the ideal.

110J. Power in American Society (4)
This course examines how power has been conceived and contested during the course of American history. The course explores the changes which have occurred in political rhetoric and strategies as America has moved from a relatively isolated agrarian and commercial republic to a military and industrial empire.

110N. Theories of Nationalism (4)
Nationalist ideologies. Examination of the rhetoric of nationalist mobilization. Theories about the relationship between nationalist movements and democracy, capitalism, warfare, and the state.

110T. Modern Political Ideologies (4)
An examination of some of the ideas and values associated with major social and political movements in Europe and the United States since the French Revolution. Topics will vary and may include liberalism, populism, democarcy, communism, nationalism, fascism, and feminism.

112A. Economic Theories of Political Behavior (4)
An introduction to theories of political behavior developed with the assumptions and methods of economics. General emphasis will be upon theories linking individual behavior to institutional patterns. Specific topics to be covered will include collective action, leadership, voting, and bargaining.

113B/213B. Chinese and Japanese Political Thought I (4/4)
Examines philosophical traditions of ancient and modern China and Japan, to understand how these have been reflected in Chinese and Japanese development. Course will be in English; however, students with Chinese or Japanese language skills will have opportunity to use these. Graduate students will be required to complete a seminar-length research paper; undergraduate students will write a paper. *Prerequisites: upper-division standing for 113B; graduate standing or consent of instructor for 213B.*

114B. Marxist Political Thought (4)
An introduction to Marxist thought from its roots in the western tradition through its development in non-western contexts. Emphasis is placed on how adaptations were made in Marxism to accommodate the specific challenges of each environment.

115A. Gender and Politics (4)
Our understanding of politics, power, conflict, and quality continue to be challenged and transformed by considering gender as it intersects with nationality, race, class, and ethnicity. We will consider the importance of gender in each of the subfields of political science.

116A. Feminist Theory (4)
Readings in historical and contemporary feminist theory; development of gender as a category of political analysis; alternative perspectives on core concepts and categories in feminist thought.

116B. Advanced Feminist Theory (4)
Advanced critical analysis of contemporary feminist theory; emphasis on the interrelationships among discourses of gender, race, ethnicity, class, and sexuality in the work of different feminist theorists; alternative perspectives on feminist political strategies and practices. *Prerequisite: PS 115B or PS 116A.*

117. Violence and Social Order (4)
This course explores the relationship between violence and the elements of social order, including social hierarchies, group boundaries, power, and authority. Topics include both classic and contemporary works in political theory, as well as some fiction and journalism.

118A. The "Political" in Systematic Theology (4)
An historical analysis of systematic theology in the Judeo-Christian tradition as political theory. Emphasis is placed on the politicization of the political dimensions of the early church, its encounter with positivism, and the emergence of Catholic social doctrine.

118B. The Political Theory of Liberation Theology (4)
A comparative study of liberation theologies, including Continental, Latin American, South African, and East Asian. *Prerequisite: PS 118A.*

119A. Special Topics in Political Theory (4)
An undergraduate course designed to cover various aspects of political theory.

Comparative Politics

120A. Political Development of Western Europe (4)
An examination of various paths of European political development through consideration of the conflicts which shaped these political systems: the commercialization of agriculture; religion and the role of the church; the army and the state bureaucracy; and industrialization. Stress will be on alternative paradigms and on theorists.

120B. The German Political System (4)
An analysis of the political system of the Federal Republic of Germany with an emphasis on the party system, elections, executive-legislative relations, and federalism. Comparisons will be made with other West European democracies and the Weimar Republic.

120C. Politics in France (4)
This course will examine the consequences of social and economic change in France. Specific topics will include institutional development under a semi-presidential system, parties, and elections.

120D. Germany: Before, During, and After Division (4)
Consideration of political, economic, and security factors that have kept Germany at the center of European developments for more than a century.

120H. European Integration (4)
This course reviews the origins and development of the European Community/European Union and its institutions, theories of integration and the challenges inherent in the creation of a supranational political regime.

120I. Politics in Italy (4)
This course will provide a comparative perspective on the development and functioning of the Italian political system. It includes analysis of political institutions, ideological traditions, parties and elections, political elites in the policy process, and the evolving importance of Italy within European integration.

120K. Politics of Developing Countries (4)
This course critically examines central concepts and theories of development, and assesses their utility in understanding political, economic, and social change in three regions of the developing world: Latin American, sub-Saharan Africa, and Southeast Asia.

121. Government and Politics of the Middle East (4)
This course examines general themes affecting the region (social structure and regime type, religion and modernization, bonds and tensions), the character of major states, and efforts to resolve the conflict between Israel and its Arab and Islamic neighbors. *Prerequisite: upper-division standing.*

121B. Politics in Israel 4)
An interdisciplinary study of Israel as both a unique and yet a common example of a modern democratic nation-state. We will examine Israel's history, its political, economic, and legal systems, social structure and multicultural tensions, the relation between state and religion, national security, and international relations.

122B. The Political Trial: Comparative Perspectives on the Politics of Justice (4)
A study of the political drawing on cases selected from the French and Russian Revolutions, the Nuremberg and Tokyo War Crimes Trials, revolutionary China and Cuba, and the Vietnam War era. The course will examine critically the relationship between politics and the administration of justice across time, culture, and political systems.

124B. The Politics of Comparative Judicial Development (4)
Focusing on judicial systems in civil and common law traditions, and in authoritarian as well as democratic politics, this course explores the judicial branch's traditional weakness, even in some democracies. The course considers alternative theories of judicial development and applies them to evidence from judicial systems in several countries.

125. The Politics of Conservation in Developing Countries (4)
Conservation in developing countries concerns resources that are extremely important to policymakers, militaries, environmental organizations, communities, and individuals. This course examines these groups' struggle for control over wildlife and forests—from the capital to the village—on several continents.

125A. Communities and the Environment (4)
A popular new idea in environmental protection is to include local communities in conservation efforts. But what are these communities? What challenges do they face in governing their own resources? This course uses both theory and case studies to explore the political economy of community-based conservations.

126AA. Fundamentals of Political Economy: Modern Capitalism (4)
This course explores how economic factors affect political institutions and how political action affects economic behavior in the United States and Western Europe. Particular attention is given to relations between business and labor, economic policy choices, and the impact of international trade. *Prerequisite: PS 11 or consent of instructor.*

126AB. Politics and Economics in Eastern Europe (4)
This course explores the interrelationship of politics and economics in Eastern Europe, analyzing the historic evolution of the area, the socialist period, and contemporary political and economic change there.

126AC. Issues in Political Economy (4)
Seminar deals in-depth with one or some of the issues touched on in PS 126AA and/or 126AB. Potential topics may include: labor and politics, privatization and divestment, regulation and deregulation, the welfare state, politics of public and private bureaucracy, and other such issues. *Prerequisites: PS 126AA and/or 126AB or consent of instructor.*

130AA. The Soviet Successor States (4)
An overview of the historical background and contemporary politics of the fifteen successor states of the Soviet Union.

130AC. Seminar: Post-Soviet Politics (4)
Undergraduate research seminar on the Post-Soviet Union. Issues and research areas will vary each time the course is offered. *Prerequisite: consent of instructor.*

130AD. The Politics of the Russian Revolution (4)
An examination of the dynamics of the Russian Revolution from 1905 through the Stalinist period and recent years in light of theories of revolutionary change. Emphasis is placed on the significance of political thought, socio-economic stratification, and culturo-historical conditions.

130H. Vietnam: The Politics of Intervention (4)
This course will examine the interventions of foreign powers in Vietnam between 1945 and 1975 (including France, the United States, China, and the Soviet Union) and the effects of intervention.

131C. The Chinese Revolution (4)
An analysis of the dynamics of the Chinese Revolution from the fall of the Qing Dynasty (1644–1911) to the present. Emphasis is placed on the relationship between political thought and the dynamics of the revolutionary process.

132C. Political Development and Modern China (4)
Political development has dominated the study of comparative politics among U.S. academicians since the revival of the Cold War in 1947. This course examines critically this paradigm and its Western philosophical roots in the context of the experience of modern China.

133D. Political Institutions of East Asian Countries (4)
This course discusses the following major topics in three East Asian countries (Japan, South Korea, and Taiwan) from a comparative perspective: (a) economic and political development (b) political institutions (c) public policies.

133F. Governments and Politics of Southeast Asia (4)
This course looks at one of the world's most dynamic and complex regions. The course has three parts: a review of the history and politics of the region; a country-by-country study of several Southeast Asian states; and a look at major challenges facing the region. *Prerequisite: upper-division standing.*

134AA. Comparative Politics of Latin America (4)
Comparative analysis of contemporary political systems and developmental profiles of selected Latin American countries, with special reference to the ways in which revolutionary and counter-revolutionary movements have affected the political, economic, and social structures observable in these countries today. Analyzes the performance of "revolutionary" governments in dealing with problems of domestical political management, reducing external economic dependency, redistributing wealth, creating employment, and extending social services. Introduction to general theoretical works on Latin American politics and development. *Prerequisite: PS 11 or consent of instructor.*

134B. Politics in Mexico (4)
General survey of the Mexican political system as it operates today. Emphasis on factors promoting the breakdown of Mexico's authoritarian regime and the transition to a more democratic political system. Changing relationship between the state and various segments of Mexico society (economic elites, peasants, urban labor, and the Church). New patterns of civil-military relations.

134C. Politics in Mexico (4)
Continuation of PS 134B. Emphasis on government policies and performance affecting economic development, job creation, population growth, social inequality, poverty, rural-urban imbalances, and migration. Case studies of specific government programs and regional variations in policy outcomes.

134N. Politics in Central America (4)
Focused examination of political conflict in one or more countries of the region, emphasizing issues, ideology, and process in grassroots political organization. Limited coverage of international politics.

136A. Nationalism and Ethnic Conflict (4)
Appropriate case studies from around the world will be selected.

136B. Comparative Politics and Political Culture (4)
This course is designed to provide undergraduates with a sound introduction to cultural interpretations of power and politics. The course will also attempt to render an explicit account of the process of theory formation in social science. Special attention will be given to Africa and Asia.

136C. Comparative Bureaucracy (4)
Politics of the administrative state in the world's democracies. How political institutions influence governance across different types of democratic institutional environments.

137A. Comparative Political Parties and Interest Groups (4)
This course serves as an introduction to the comparative study of political parties and interest groups. The course has three parts: 1) an analytical introduction to parties, interest groups, and their role in democratic representation; 2) parties and interest groups in Great Britain; and 3) parties and interest groups in Italy. *Prerequisite: PS 11 or consent of instructor.*

138D. Special Topics in Comparative Politics (4)
An undergraduate course designed to cover various aspects of comparative politics.

139A. Politics of the Ancient World Order (4)
An introduction to the domestic and international political orders of the ancient West. Primary focus will be on the strengths and limitations of comparative and international relations theories when applied to the ancient world of city-states, kingdoms, and empires.

International Relations

140A. International Law and Organizations (4)
International law and organizations are central to the efforts to create a world order to limit armed conflict, regulate world economy, and advance programs for economic redistribution among nations, and set minimum standards of human rights. This course explains the theory of international law and organizations that is accepted by diplomats and compares this viewpoint to the analysis of social scientists concerning the past record and likely future of world order concerning conflict, economic redistribution, and human rights.

142A. United States Foreign Policy (4)
United States foreign policy from the colonial period to the present era. Systematic analysis of competing explanations for U.S. policies—strategic interests, economic requirements, or the vicissitudes of domestic politics. Interaction between the U.S., foreign states (particularly allies), and transnational actors are examined. *Prerequisite: PS 12 or consent of instructor.*

142B. U.S. Foreign Economic Policy (4)
Seeks to explain U.S. foreign economic policies. Topics include: globalization—benefits and costs, winners and losers; interest group influence on trade policy; domestic and international institutions; multinational corporations; exchange rates; currency crises; environment and labor standards.

142I. National and International Security (4)
A survey of theories of defense policies and international security.

142J. National Security Strategy (4)
A survey of American strategies for national defense. Topics may include deterrence, coercive diplomacy, limited war, and unconventional warfare.

142K. Politics and Warfare (4)
This course offers an exploration of general theories of the origins of warfare; the impact of the state on war in the modern world; and the micro-foundations of combat and compliance in the context of the costs of war and military mobilization. The course should be of special interest to students in international relations and comparative politics.

142L. Insurgency and Terrorism (4)
"Terrorism" uses "illegitimate" violence to achieve political goals. This course uses philosophical, historical, and contemporary material from distinct cultures to understand which actions are defined as "terrorist," who uses them, why, and when, as well as the determinants of their effectiveness.

142M. U.S. Foreign Policy/Regional Security (4)
Lectures and readings examine U.S. foreign policy in Europe, Latin America, and East Asia with attention to current problems with specific nations (e.g., Bosnia) and issues (e.g., terrorism). This course integrates historical, comparative, and foreign perspectives on regional security dynamics. Credit will not be given to students who took PS 154 Special Topic/International Relations with the subtitle U.S. Foreign Policy/ Regional Security, in spring 1998, spring 2001, or fall 2002.

144AA. Politics and the International Economic Order (4)
This course examines the interplay of politics and economics in international relations and entails a review of the history of the international economic order from the seventh century through the present. Stress is placed on the evolution of the bargaining about money, trade, and investment.

144AB. Selected Topics in International Political Economy (4)
This course will consider major theories purporting to explain and predict the workings of the international order from the point of view of political economy. An extended discussion of one aspect of the economic order (e.g., the multinational corporation) will serve as the test case. PS 144AA and one quarter of economics recommended. *Prerequisite: PS 12.*

144D. Political Dimensions of International Finance (4)
(Conjoined with PS 262, IP/Gen 402, and IP 202.) Examination of effects of national policies and international collaboration of public and private international financial institutions, in particular management of international debt crisis, economic policy coordination, and the role of international lender of last resort. *Prerequisite: upper-division standing or permission of instructor. Previous background in economics strongly recommended.*

144E. The Politics of International Trade (4)
Examines theories of trade and protectionism, focusing both on relations among advanced industrial nations and on relations between developed and developing countries. Topics include standard and strategic trade theory, nontariff barriers to trade, export-led growth strategies, regional trade agreements, and the future of the WTO.

144F. The Politics of International Trade and Finance (4)
Examines the welfare and distributional aspects of international trade and finance as they relate to the politics of economic policymaking. Topics include: globalization in historical perspective; origins and consequences of trade policy; exchange-rate arrangements; international capital flows; currency crises; economic development.

145A. International Politics and Drugs (4)
This course examines the domestic and international aspects of the drug trade. It will investigate the drug issues from the perspectives of consumers, producers, traffickers, money launderers, and law enforcement. Course material covers the experience of the United States, Latin America, Turkey, Southeast Asia, Western Europe, and Japan.

145B. Conflict and Cooperation in International Politics (4)
Course on how countries overcome problems of conflict and cooperation in their dealings with one another. Focuses on theories of emergence of cooperation among states and applies these to various issue-areas. Subjects examined include international monetary relations, military alliances, economic sanctions, human rights, arms control, international trade, and others. *Prerequisite: PS 12.*

145C. International Relations After the Cold War: Theory and Prospect (4)
The nature of international politics appears to have changed dramatically since the end of the Cold War in 1989. This course applies different theoretical approaches to enhance our understanding of the new international environment, the future prospects for peace and war, and current problems of foreign policy.

146A. The U.S. and Latin America: Political and Economic Relations (4)
An analytical survey of U.S. relations with Latin America from the 1820s to the present, with particular emphasis on the post-Cold War environment. Topics include free trade and economic integration; drugs and drug trafficking; illegal migration and immigration control. Focus covers U.S. policy, Latin American reactions, dynamics of cooperation, and options for the future.

146E. U.S.-Latin American Relations: Security Issues (4)
This course will examine the history of security relations in the western hemisphere. They will be considered in global, regional, and rational contexts. International institutions, economic relations, domestic politics, and military issues will be examined for their contribution to explaining the evolution of the inter-American security agenda from independence to the post-Cold War. *Prerequisite: PS 12.*

146XL. 146E U.S.-Latin American Relations: Security Issues Foreign Language Discussion Section (1)
Students will exercise advanced foreign language skills to discuss materials in the PS 146E course. This section is taught by the course professor; has no final exam, and does not affect grade in PS 146E. *Prerequisite: must be co-registered in PS 146E.*

150A. Politics of Immigration (4)
Comparative analysis of attempts by the United States, western Europe, and Japan to initiate, regulate and reduce immigration from Third World countries. Social and economic factors shaping outcomes of immigration policies, public opinion toward immigrants, anti-immigration movements, and immigration policy reform options in industrializedcountries.

152. Foreign Policy Analysis (4)
This upper-division course focuses on the comparative study of foreign policies in contemporary and historical world affairs. Competing theoretical approaches drawn from international, domestic, and individual levels of analyses will be examined. War, security, alliances, and international crises will be used to evaluate the utility of competing approaches. *Prerequisite: PS 12.*

154. Special Topics in International Relations (4)
An undergraduate course designed to cover various aspects of international relations.

Policy Analysis

160AA. Introduction to Policy Analysis (4)
(Same as USP 101) This course will explore the process by which the preferences of individuals are converted into public policy. Also included will be an examination of the complexity of policy problems, methods for designing better policies, and a review of tools used by analysts and policy makers. *Prerequisite: PS 10 or 11.*

160AB. Introduction to Policy Analysis (4)
In this course, students will use their knowledge of the political and economic foundations of public policy making to conduct research in a wide variety of public policy problems. *Prerequisite: PS 160AA.*

161. Understanding Direct Legislation (4)
The purpose of the course is to examine how the referendum, initiative, and recall (direct legislation) are used to determine policy. The class will survey the historical and contemporary direct legislation literature in order to understand the popular and academic debate concerning direct legislation's use.

162. Environmental Policy (4)
This course will explore contemporary environmental issues such as global warming, endangered species, and land use. Students will be asked to analyze various policy options and to write case analyses. Policies may be debated in class.

163. Analyzing Politics (4)
Politics are understood as the combination of individual preferences and decisions into collective choices. What are the issues involved in aggregating individual preferences, what is the choice of rules—formal and informal—for doing so.

165. Special Topic: Policy Analysis (4)
An undergraduate course designed to cover various aspects of policy analysis.

166F. The American Welfare State (4)
(Same as USP 112) This course examines the building of the welfare state in the twentieth century. Topics include the legacy of progressivism, the New Deal and Great Society; Reaganite retrenchment; social programs, party and electoral dynamics; and the welfare state's impact on groups and the class structure.

167A. Seminar: Public Policy Analysis (4)
Students are asked to analyze various policy options related to contemporary American policy issues. Students are also required to do directed research on policy issues, to write case analyses based on their findings, and to debate policy alternatives in class. *Prerequisite: PS 10 or 11.*

168. Policy Assessment (4)
The use of real data to assess policy alternatives. Introduction to benefit/cost analysis, decision theory, and the valuation of public goods. Applications to health, environmental, and regulatory economic policy making.

Research Methods

181A. Field Research Methods for Migration Studies: Seminar (4)
Introductory survey of methods used by social scientists to gather primary research data on international migrant and refugee populations, including sample surveys, unstructured interviewing, ethnographic observation, and archival research. Basic fieldwork practices and problem-solving techniques will also be covered. Students planning to take the continuation of this course, Political Science 181B, should note that conversational fluency Spanish is a requirement for Political Science 181B. *Prerequisites: upper-division status, permission of instructor.*

181B. Field Research Methods for Migration Studies: Practicum (12)
Continuation of Political Science 181A. Students will apply one or more data collection methods learned in Political Science 181A to collect data from a sample of international migrants, refugees, or returned migrants in a high-migration community. Students participate in team field research, write a detailed individual report on the fieldwork experience and submit a detailed outline of a research paper to be based on data from the fieldwork, required of students who take the continuation of this course, Political Science 181C. Prior to fieldwork, students will read intensively about the research site and write a literature review essay. *Prerequisites: upper-division status, Political Seicnec 181A, conversational fluency in Spanish, permission of instructor.*

181C. Field Research Methods for Migration Studies: Data Analysis (4)
Continuation of Political Science 181B. Students will analyze primary data that they have helped to collect in a field research site and write a major paper based on these data for publication as a section of a co-authored report on the field research project. Methods for organizing and processing field research data for analysis, techniques of quantitative data analysis, and report preparation conventions will be covered. *Prerequisites: upper-division status, Political Science 181B, permission of instructor.*

Special Studies

191A-B. Senior Honors Seminar: Frontiers of Political Science (4-4)
This course is open only to seniors interested in qualifying for departmental honors. Admission to the course will be determined by the department. Each student will write an honors essay under the supervision of a member of the faculty.

194. Research Seminar in Washington, D.C. (4)
(Same as Com/Gen 194; USP 194, HIST 193, SocE 194, ERTH 194, COGS 194) Course attached to six-unit internship taken by students participating in the UCDC program. Involves weekly seminar meetings with faculty and teaching assistant and a substantial research paper. *Prerequisites: participating in UCDC program.*

197I. Political Science Washington Internship (6)
This internship is attached to the UC in DC Program. Students participating in the UC in DC Program are

placed in an internship in the Washington, DC, area for twenty-four hours per week. *Prerequisites: must be enrolled in the UC in DC Program.*

199. Independent Study for Undergraduates (2 or 4)
Independent reading in advanced political science by individual students. (P/NP grades only.) *Prerequisite: consent of instructor.*

GRADUATE

All graduate courses are categorized as either seminars or independent study.

Seminars

200. Political Science: Scope and Methods (4)
This course examines a variety of approaches to the study of politics, focusing on their intellectual history, canonical works that illustrate their major themes, and methodological critiques and defenses. The course seeks to clarify how interesting and important questions are discovered and how appropriate research is designed and executed.

200A. Foundations of Political Science (4)
An introduction to the theoretical concepts in the discipline of political science that are commonly used across various sub-fields. Each week will introduce the core concept(s) and discuss applications from several, if not all sub-fields in the department.

200B. Democracy (4)
An overview of the normative and positive issues associated with modern democracies. The appeal and the social, political, and economic arrangements of democracies will be explored.

200C. States and Markets (4)
An overview of the normative and positive issues associated with decentralized (market) versus centralized (political) mechanics of allocation. The appropriate role of government in the economy will be explored.

203. Math for Political Science (4)
Mathematical skills necessary for doing graduate work in political science. Topics include optimization, linear algebra, probability, set theory, and formal logic.

204A. Research Design (4)
This course will study various approaches to knowledge accumulation in social science. A basic outline of scientific method will be used to examine the difference between theories as assumptions and axioms and hypotheses as "if-then" statements derived from theory. Experimental, quasi-experimental, and qualitative designs will be discussed.

204B. Quantitative Methods I (4)
The use of quantitative methods (particularly multiple regression and its extensions) in political science. Emphasis on understanding the methods and using them in political science applications.

204C. Game Theory 1 (4)
This course introduces students to the rudiments of decision theory and game theory. Emphasis will be placed on modeling and solving games.

210A. Systems of Political Thought: Thucydides to Augustine (4)
This course is a preparation for the field examination in political theory. It will provide an intensive and critical introduction to European political thought from Thucydides to Augustine. Some of the secondary literature on this period will also be explored.

210B. Systems of Political Thought: Machiavelli to Rousseau (4)
This course is a preparation for the field examination in political theory. It will provide an intensive and critical introduction to European political thought from Machiavelli to Rousseau. Some of the secondary literature on this period will also be explored.

210C. Systems of Political Thought: Kant to Nietzsche (4)
This course is a preparation for the field examination in political theory. It will provide an intensive and critical introduction to European political thought from Kant to Nietzsche. Some of the secondary literature on this period will also be explored.

210D. Systems of Political Thought: Contemporary (4)
This course is a preparation for the field examination in political theory. It will provide an intensive and critical introduction to twentieth-century political thought. Some of the secondary literature on this period will also be explored.

211A. American Political Thought (4)
This course explores American debates over political ideals, institutions, and identity from the Puritans to the present. Themes will include freedom and slavery, sovereignty and representation, individual and community, diversity and equality. Readings will vary from year to year. *Prerequisite: graduate standing or consent of instructor.*

212A. The Political Uses of Antiquity (4)
This course explores debates in the history of political thought about classical antiquity and its relationship to the modern world. The meaning, motivation, and significance of gestures toward antiquity as a model for judging contemporary politics and culture will be discussed. *Prerequisite: graduate standing or consent of instructor.*

113B/213B. Chinese and Japanese Political Thought I (4/4)
Examines philosophical traditions of ancient and modern China and Japan, to understand how these have been reflected in Chinese and Japanese development. Course will be in English; however, students with Chinese or Japanese language skills will have opportunity to use these. Graduate students will be required to complete a seminar-length research paper; undergraduate students will write a paper. *Prerequisites: upper-division standing for 113B; graduate standing or consent of instructor for 213B.*

215. The Self and the Political Order (4)
The course deals with the interrelationship of understandings of the political order and understandings of the self. The course will focus on the two great theorists of modernity, Rousseau and Nietzsche. Extensive readings from primary and secondary sources. *Prerequisite: graduate standing or consent of instructor.*

218A. The "Political" in Systematic Theology (4)
An historical analysis of systematic theology in the Judeo-Christian tradition as political theory. Emphasis is placed on the politicization of the political dimensions of the early Church, its encounter with positivism, and the emergence of Catholic social doctrine. *Prerequisite: upper-division standing or consent of instructor. Two courses in philosophy, or political or social theory are recommended, or graduate standing.*

218B. The Political Theory of Liberation Theology (4)
A comparative study of liberation theologies, including Continental, Latin American, South African, and East Asian. *Prerequisite: graduate standing or consent of instructor.*

219. Special Topics in Political Theory (4)
This seminar is an examination of the different approaches to the study of political theory. Issues and research areas will vary each time the course is offered. *Prerequisite: graduate standing or consent of instructor.*

220. Comparative Politics: State and Society (4)
This course will provide a general literature review in comparative politics to serve as preparation for the field examination. *Prerequisite: graduate standing in any discipline in the social sciences or humanities, or consent of instructor.*

221. Comparative Politics: Institutions (4)
This is a second course in comparative politics designed as a preparation for the field examination. It will focus on the comparative study of political institutions. *Prerequisite: graduate standing in any discipline in the social sciences or humanities, or consent of instructor.*

222. Measuring Democracy (4)
Research seminar that focuses on the problems of measurement, operationalization, and validity in the comparative study of types, causes, and consequences of democracy.

222A. American Politics in Comparative Perspective (4)
Research seminar that focuses on the systematic comparison of the American political system with about thirty other contemporary democracies, particularly the other large industrialized countries. A central aim will be to assess the claims about American "exceptionalism." *Prerequisite: graduate standing or consent of instructor.*

223A. Comparative Parliamentary Studies (4)
This course surveys the academic literature on parliamentary studies comparing the research on legislative elections. Behavior and organization in American, European, and Asian democracies. The course will also compare various approaches to studying legislative activity. *Prerequisite: graduate standing.*

225. The Politics of Divided Societies (4)
Research seminar that surveys the theoretical literature on divided societies in Africa, Asia, Europe, North America, and South America, particularly conflict and peacemaking in multiethnic countries. Cases to be studied in depth will be selected in accordance with students' area and country interests. *Prerequisite: graduate standing or consent of instructor.*

226. Authoritarian Politics (4)
Research seminar that surveys the theoretical literature on non-democratic political systems. Readings draw from cases in Africa, Asia, Europe, and Latin America. *Prerequisite: graduate standing or consent of instructor.*

228. Comparative Bureaucracy (4)
This course examines the politics of the administrative state in the world's democracies. The course focuses on how political institutions affect the nature of governance in democracies.

229. Special Topics in Comparative Politics (4)
This seminar is an examination of the different approaches to the study of comparative politics. Issues and research areas will vary each time the course is

offered. *Prerequisite: graduate standing or consent of instructor.*

230A. The Mexican Political System (4)
An interdisciplinary graduate seminar covering selected aspects of Mexican politics, economic development, and social change. Attention to both domestic and international factors affecting Mexico's transition to a more democratic system. Materials to be drawn from literatures in anthropology, economics, history (twentieth century), political science, sociology, urban studies, and communication. Topics vary from year to year partly reflecting research interests of participating students. Students are expected to write substantial research papers or thesis proposals. *Prerequisite: graduate standing or consent of instructor.*

231A. Political and Economic Development in Eastern Europe: Historical Perspective (4)
This course deals with issues in economic and political development in Eastern Europe prior to World War II. *Prerequisite: graduate standing or consent of instructor.*

231D. Politics of the Soviet Successor States (4)
A colloquium surveying major controversies in the analyses of Soviet and post-Soviet politics. *Prerequisite: graduate standing or consent of instructor. Cannot also receive credit for PS 231.*

231E. Politics of Development (4)
This course provides an overview of previous and current efforts to explain political and economic development in non-western settings. *Prerequisite: graduate standing or consent of instructor.*

232C. Political Development and Modern China (4)
Political development has dominated the study of comparative politics among U.S. academicians since the revival of the Cold War in 1947. This course examines critically this paradigm and its Western philosophical roots in the context of the experience of modern China. *Prerequisite: graduate standing or consent of instructor.*

235A. Latin American Politics (4)
Introductory reading seminar on Latin American politics to acquaint students with leading schools of thought, provide critical perspective on premises and methodology, and identify themes for further inquiry. Themes include authoritarianism, revolution, democratization, regional conflict, and emergence of middle-level powers.

236. Immigration Policy and Politics (4)
An interdisciplinary seminar covering origins, consequences, and characteristics of worker migration from Third World countries (especially Mexico, Central America, and the Caribbean basin) to the United States, from the nineteenth century to the present.

240. International Relations Theory (4)
A survey of the principal theories and approaches to the study of international relations. *Prerequisite: graduate standing or consent of instructor.*

243. International Security (4)
A colloquium surveying the major theoretical controversies in the study of international and national security. *Prerequisite: graduate standing or consent of instructor.*

244A. European Integration (4)
This seminar provides perspectives on the theories and politics of European integration. Analysis will focus on the development of the European Union, the functioning of core institutions, and the challenges of creating a supranational political regime.

245. International Political Economy (4)
A seminar surveying the major theoretical controversies in the study of international political economy. *Prerequisite: graduate standing or consent of instructor.*

247A. Quantitative International Relations (4)
Explores empirical research in international relations with special emphasis on international conflict. Topics covered include theories on the causes of war, the distribution of power and conflict, formal and informal alignment, interdependence and conflict, linkages between domestic and international processes, and issues of research design. *Prerequisite: graduate standing or consent of instructor.*

247B. Formal Models in International Relations (4)
Explores formal analytic and primarily game-theoretic research in international relations with emphasis on conflict and bargaining. Topics include: causes of war and peace, conventional and nuclear deterrence, crisis bargaining, arms race, and two-level games.

248. Special Topics in International Relations (4)
(Same as IRGN 290) This seminar is an examination of the different approaches to the study of international relations. Issues and research areas will vary each time the course is offered. *Prerequisite: graduate standing or consent of instructor.*

250. American Politics (4)
This course will provide a general literature review in American politics to serve as preparation for the field examination. *Prerequisite: graduate standing in any discipline in the social sciences or humanities, or consent of the instructor.*

251. American Political Institutions (4)
A critical examination of major contributions to the theoretical and empirical literature on the U.S. Congress, presidency, and federal bureaucracy. *Prerequisite: graduate standing or consent of instructor.*

252. American Politics: Behavior
Theoretical and empirical perspectives on voting and other forms of political participation, parties, interest groups, and public opinion in the United States. *Prerequisite: graduate standing or consent of instructor.*

254. American Political Development (4)
This course examines the historical evolution of the American state with particular attention to theories of political development. Special topics include the development of the party system, electoral and policy realignments, and the evolution of national political institutions. *Prerequisite: graduate standing in any discipline of the social sciences or humanities or consent of instructor.*

255. Urban Politics (4)
Examines central works on the development of political institutions in U.S. cities; analyses of community power structures; who governs, why, and to what ends; processes and prospects for minority empowerment; the prominence of "growth machines"; the political economy of contemporary cities. *Prerequisite: graduate standing or consent of instructor.*

256. Jurisprudence and Public Law (4)
An introduction to the field, including discussion of major jurisprudential theories (Dworkin, Ely, etc.) and constitutional controversies (e.g., abortion, the First Amendment). *Prerequisite: graduate standing.*

256A. Judicial Politics (4)
Judicial politics is the study of law and courts as political institutions and judges as political actors, focusing on decision-making and power relations within courts, within the judicial hierarchy, and within the constitutional system.

257. Voting and Elections (4)
This course is designed to acquaint graduate students with the central themes and issues in the study of voting in national elections. *Prerequisite: graduate standing or consent of instructor.*

258. Advanced Topics in Jurisprudence and Public Law (4)
This seminar will explore a single broad topic in depth, using both case material and discussions of the topic in empirical and theoretical literature. Examples of topics include race and the law; and sexuality, gender, and the law. Intended for graduate students preparing general exams in jurisprudence and public law, American politics, and political theory.

259. Special Topics in American Politics (4)
This seminar is an examination of the different approaches to the study of American politics. Issues and research areas will vary each time the course is offered. *Prerequisite: graduate standing or consent of instructor.*

273B. Game Theory and Political Applications (4)
This course builds on the concepts and methods in 273A, exploring the use of formal models in political science. *Prerequisite: PS 273A or consent of instructor.*

282A-B-C. Workshop on State and Society (4-4-4)
Examination of recent research in American politics, comparative politics, and political theory concerning the relationship of politics to society; development and presentation of research projects by graduate students; presentations of research projects by faculty. Second-year students present seminar paper; third-year students present dissertation prospectus; candidates make yearly presentations of dissertation research. *Prerequisite: PS 202 or consent of instructor.*

283A-B-C. Workshop in International Relations (4-4-4)
Examination of recent research in international politics; development and presentation of research projects by graduate students; presentations of research projects by faculty. Second year students present seminar paper; third year students present dissertation prospectus; candidates make yearly presentation of dissertation research. *Prerequisite: PS 202 or permission of instructor.*

284. Workshop on Scientific Communication (4)
Forms of scientific communication, practical exercise in scientific writing and short oral communication, and in criticism and editing; preparation of illustrations, preparation of proposals; scientific societies, and the history of scientific communication. Examples from any field of science, most commonly political science, economics, and law. *Prerequisite: PS 202 or consent of instructor.*

286A-B-C Workshop in Political Analysis (4-4-4)
Students will read and critique new research articles in political analysis. Students will present these critiques to the workshop. Students will also present their own methodological analyses to the workshop. *Prerequisite: graduate standing or consent of instructor.*

Independent Study

291A. Research Tutorial in American Politics (4)
Tutorial in a selected area of American politics leading to a research paper. The content of each tutorial will be

determined by the professor. *Prerequisite: graduate standing in political science.*

291D. Research Tutorial in Political Theory (4)
Tutorial in a selected area of political theory leading to a research paper. The content of each tutorial will be determined by the professor. *Prerequisite: graduate standing in political science.*

298. Directed Reading (1-12)
Guided and supervised reading in the literature of the several fields of political science.

299. Dissertation Research (1-12)
Independent work by graduate students engaged in research and writing of second-year paper and doctoral dissertation, under direct supervision of adviser.

500. Apprentice Teaching (1-4)
A course in which teaching assistants are aided in learning proper teaching methods by means of supervision of their work by the faculty: handling of discussions, preparation, and grading of examinations and other written exercises, and student relations. Twenty-four units of teaching apprenticeship meets the department teaching requirement for the Ph.D. degree.

501. Seminar on Teaching Development—American Politics (1-4)
A seminar designed for graduate students serving as teaching assistants in American politics, includes discussion of teaching theories, techniques, and materials, conduct of discussion sessions, and participation in examinations, under the supervision of the instructor in charge of the course. *Prerequisite: graduate standing.*

502. Seminar on Teaching Development—Comparative Politics (1-4)
A seminar designed for graduate students serving as teaching assistants in comparative politics, includes discussion of teaching theories, techniques, and materials, conduct of discussion sessions, and participation in examinations, under the supervision of the instructor in charge of the course. *Prerequisite: graduate standing.*

503. Seminar on Teaching Development—International Relations (1-4)
A seminar designed for graduate students serving as teaching assistants in international relations, includes discussion of teaching theories, techniques, and materials, conduct of discussion sessions, and participation in examinations, under the supervision of the instructor in charge of the course. *Prerequisite: graduate standing.*

504. Seminar on Teaching Development—Political Theory (1-4)
A seminar designed for graduate students serving as teaching assistants in political theory, includes discussion of teaching theories, techniques, and materials, conduct of discussion sessions, and participation in examinations, under the supervision of the instructor in charge of the course. *Prerequisite: graduate standing.*

Psychology

STUDENT SERVICES OFFICE:
1533 McGill Hall Annex

Professors

Thomas D. Albright, Ph.D., *Adjunct*
Norman H. Anderson, Ph.D., *Emeritus*
Stuart M. Anstis, Ph.D.
Mark I. Appelbaum, Ph.D., *Associate Vice Chancellor*
Richard C. Atkinson, Ph.D., *Emeritus*
Ursula Bellugi, Ph.D., *Adjunct*
Robert M. Boynton, Ph.D., *Emeritus*
Sandra A. Brown, Ph.D.
Nicholas Christenfeld, Ph.D.
Francis H. C. Crick, Ph.D., *Adjunct*
Diana Deutsch, Ph.D.
J. Anthony Deutsch, D. Phil, *Emeritus*
Karen R. Dobkins, Ph.D.
Ebbe B. Ebbesen, Ph.D.
Edmund J. Fantino, Ph.D.
Steven A. Hillyard, Ph.D., *Adjunct*
Vladimir J. Konečni, Ph.D.
George F. Koob, Ph.D., *Adjunct*
James A. Kulik, Ph.D.
Donald I. A. MacLeod, Ph.D.
George Mandler, Ph.D., *Emeritus*
Harold E. Pashler, Ph.D.
John M. Polich, Ph.D., *Adjunct*
Vilayanur S. Ramachandran, Ph.D., M.B.B.S.
Pamela A. Sample, Ph.D., *Adjunct*
Laura E. Schreibman, Ph.D.
Larry R. Squire, Ph.D., *In-Residence*
David A. Swinney, Ph.D.
Paul E. Touchette, Ph.D., *Adjunct*
Ben A. Williams, Ph.D.
John T. Wixted, Ph.D., *Chair*

Associate Professors

Karen Emmorey, Ph.D., *Adjunct*
Kang Lee, Ph.D.
Craig R. M. McKenzie, Ph.D.
Victor S. Ferreira, Ph.D.
Timothy C. Rickard, Ph.D.
Piotr Winkielman, Ph.D.

Assistant Professors

Stephan Anagnostaras, Ph.D.
Leslie L. Carver, Ph.D.
Beatrice Golomb, M.D., Ph.D., *Adjunct*
James L. Goodson, Ph.D.
Michael R. Gorman, Ph.D.
Christine R. Harris Ph.D.
Gail D. Heyman, Ph.D.

Affiliated Faculty

Michael Cole, Ph.D., *University Professor, Communication*
Jean M. Mandler, Ph.D., *Professor Emeritus, Cognitive Science*
Terrence J. Sejnowski, Ph.D., *Professor, Biological Sciences/Adjunct Professor, Physics, Neurosciences, Cognitive Science, and Computer Science and Engineering*

The Undergraduate Program

The Psychology Major Program

The department offers three degree programs: bachelor of arts (B.A.), bachelor of science (B.S.), and the integrated bachelor of science (B.S.)/master of arts (M.A.). We offer courses in all major areas of experimental psychology, with emphasis in behavior analysis, biopsychology, clinical psychology, cognitive psychology and cognitive neuropsychology, developmental psychology, human information processing, physiological psychology, psychopathology, sensation and perception, and social psychology. The department emphasizes research in the experimental and theoretical analysis of human and animal behavior, and the study of the mind. Students who major in psychology can expect to develop a knowledge of a broad range of content areas, as well as basic skills in experimental and analytic procedures.

Majors must have departmental approval for electives taken outside the department. Of the required courses in the area of specialization (three regular upper-division courses and two research experiences), no more than two may be taken outside the department. We recommend consulting the department before enrolling in courses offered by other departments.

Prerequisites for the B.A.

Experimental psychology uses the tools and knowledge of science: calculus, probability theory, computer science, chemistry, biology, physics, and statistics. Accordingly, students in upper-division courses must have an adequate background in these topics. Prerequisites for individual courses are specified in the catalog.

A bachelor of arts (B.A.) degree in psychology will be granted if the following requirements have been met:

1. Three lower-division, general-introductory natural science courses from the listing of the approved UCSD courses below or their equivalent. (The three courses can be distributed in any manner.)

   Biology: 1, 2, 3, 10, 12 (or Cognitive Science 17), 20, 24, 26, 30

   Chemistry: 4, 6A, 6B, 6C, 11, 12, 13

   Physics: Any of the 1 and 2 series, 10, 11

2. Three formal skills courses, at least one of which must be calculus. The other two courses may consist of any combination of courses in calculus or logic. Acceptable calculus courses at UCSD include Mathematics 10A-B-C, 20A-B-C. Acceptable logic courses at UCSD include Philosophy 10 and 12.

3. One introduction to computer programming course. Acceptable courses at UCSD are CSE 3, CSE 5A, CSE 5B, CSE 8A, CSE 8B, CSE 11, CSE 12, MAE 5, MAE 9, MAE 10, or CogSci 18. Other courses will be accepted only if they are primarily concerned with programming in a high-level computer language.

   All courses listed under 1–3 may be taken Pass/No Pass.

4. One quarter of statistics. Acceptable courses at UCSD are Psychology 60, Economics 120A, Sociology 60, Mathematics 11, or 181, BIEB 100, Cognitive Science 14, or equivalent. Statistics **MUST** be taken for a letter grade.

Students should complete these prerequisite requirements by the end of the sophomore year.

Major Requirements for the B.A.

A minimum of **twelve** upper-division courses in psychology is required. Five must be taken from the core courses (Psychology 101–106), and at least seven from the upper-division elective courses. **A minimum of six upper-division psychology courses must be taken at UCSD.** These courses must be taken for a letter grade; courses taken on a Pass/No Pass prior to declaring psychology as a major **cannot** be used to satisfy the major requirement. Excluded from credit toward the major is Psychology 199 (Special Studies); however, Psychology 195 (Instructional Assistant) can be credited once. A grade-point average of at least 2.0 in the upper-division courses of the major is required for graduation.

2XX. Graduate Seminar

We encourage juniors and seniors with an overall 3.0 GPA or better to enroll in graduate seminars. Check the schedule of classes and contact the student affairs office on how to enroll.

Honors Program for the B.A. Program

Students are encouraged to participate in the department's honors program. It is strongly recommended for all students interested in graduate schools. An overall GPA of 3.3 is a prerequisite. Admission is granted by application in the fall of the junior year (deadline October 31). This program is composed of the following courses.

1. Junior year:

   Winter: Junior Honors Research Seminar 110. Advanced Statistics and Research Methods 111A

   Spring: Advanced Statistics and Research Methods 111B

2. Senior Year: A year-long independent research project (Psychology 194-A-B-C) under the sponsorship of a faculty adviser. This research culminates in an honors thesis.

3. At least one laboratory course (Psychology 107, 109, 114 , 115, 118A, 118B, 119, 120/121, 120/140, 127) or, upon petitioning, two Psychology 199 Independent Study courses culminating in a research paper accepted by the adviser (199s, however, do not count as upper-division credit toward the major).

Successful completion of the Honors Program requires a grade of A- in Psychology 194 and a minimum GPA of 3.5 in the upper-division courses taken for the major.

Prerequisites for the B.S.

In general, the prerequisites for the B.S. degree in psychology overlap with the B.A. prerequisites. However, to fulfill the formal skills, we require the mathematics sequence 20A-B-C.

Major Requirements for the B.S.

A minimum of twelve upper-division courses is required. Five of these courses must come from the core courses: Psychology 101–106. The seven elective courses may be chosen from any of the upper-division courses listed for the psychology program at UCSD.

B.S. students must choose an area of specialization (behavior analysis, biopsychology, clinical psychology, cognitive and cognitive neuropsychology, developmental psychology, sensation and perception, or social psychology), and three courses of the seven electives must be in the chosen area of concentration.

In addition to the twelve upper-division courses, all B.S. degree students must complete **two research experience courses** in the chosen area. Research experience courses will be comprised of a combination of laboratory courses and Psychology 199 (Independent Study). If two Psychology 199 courses are taken to fulfill this requirement, they must be directed by the faculty within the chosen area of specialization and culminate in a research paper approved by the adviser and submitted to the Undergraduate Student Services Office in due time for graduation.

2XX. Graduate Seminar

We encourage juniors and seniors with an overall 3.0 GPA or better to enroll in graduate seminars. Check the schedule of classes and contact the student affairs office for how to enroll.

Honors Program for the B.S.

The honors program is strongly recommended for all students interested in graduate schools.

In general, the honors program for the B.S. is the same as for the B.A. except that only one 199 rather than two is required. **NOTE:** The senior thesis, if done with a faculty member affiliated with the chosen area of concentration, will satisfy the laboratory experience requirement.

Successful completion of the honors program requires a grade of A– in Psychology 194 and a minimum GPA 3.5 in the upper-division courses taken for the major.

Upper-Division Course Requirements for the B.S.

Core courses of which five have to be taken for any area of concentration

Psych 101	Intro to Developmental Psychology
Psych 102	Intro to Sensation and Perception
Psych 103	Intro to Principles of Behavior
Psych 104	Intro to Social Psychology
Psych 105	Intro to Cognitive Psychology
Psych 106	Intro to Physiological Psychology

Areas of concentration and their associated courses are listed in alphabetical order below. (Subject to change—for additional qualifying courses, see the department's Student Affairs Office, 1533 McGill Annex).

Concentration in Behavior Analysis

Behavior analysis is based on the principles of Pavlovian and operant conditioning, and other aspects of contemporary associative learning theory. It also includes the application of reinforcement principles and other behavior modification techniques in applied settings (applied behavior analysis).

Courses:

Psych 109 Lab / Applied Behavior Analysis
Psych 120* Learning and Motivation
Psych 121* Lab / Operant Psychology
* to be taken concurrently with Psych 120
Psych 132 Hormones and Behavior
Psych 134 Eating Disorders
Psych 135 Evolutionary Principles/Animal Social Behavior
Psych 140* Lab/Human Behavior
* to be taken concurrently with Psych 120
Psych 143 Control and Analysis of Human Behavior
Psych 154 Behavior Modification
Psych 168 Psychological Disorders of Childhood
Psych 184 Choice and Self Control
Psych 188 Impulse Control Disorders
Psych 199 Independent Study courses in this field, must culminate in a research paper to fulfill lab requirement (but do not count as upper-division psychology courses towards the major).

Concentration in Biopsychology

This area studies how the nervous system mediates behavioral effects in the realms of motivation, perception, learning and memory, and attention. It also includes human neurophysiology and aphasia.

Courses:

Psych 107 Lab / Substance Abuse Research
Psych 114 Lab/Psychophysiological Perspectives on the Social Mind
Psych 125 Clinical Neuropsychology and Assessment
Psych 129 Logic of Perception
Psych 132 Hormones and Behavior
Psych 133 Circadian Rhythms—Biological Clocks
Psych 134 Eating Disorders
Psych 135 Evolutionary Principles/Animal Social Behavior
Psych 159 Physiological Basis of Perception
Psych 169 Brain Damage and Mental Function
Psych 179 Drugs, Addiction, and Mental Disorders
Psych 181 Drugs and Behavior
Psych 188 Impulse Control Disorders
Psych 199 Independent Study courses in this field, must culminate in a research paper to fulfill lab requirement (but do not count as upper-division psychology courses towards the major).

Concentration in Clinical Psychology

This area studies psychological and physiological causes of and treatments for mental illness in children and adults.

Courses:

Psych 107 Lab / Substance Abuse Research
Psych 109 Lab / Applied Behavior Analysis
Psych 124 Intro to Clinical Psychology
Psych 125 Clinical Neuropsychology and Assessment
Psych 131 Personality: Theory and Research
Psych 132 Hormones and Behavior
Psych 133 Circadian Rhythms—Biological Clocks
Psych 134 Eating Disorders
Psych 146 Persuasive Techniques
Psych 151 Tests and Measurement
Psych 154 Behavior Modification
Psych 155 Social Psychology and Medicine
Psych 163 Abnormal Psychology
Psych 168 Psychological Disorders in Children
Psych 172 Human Sexuality
Psych 184 Choice and Self-Control
Psych 188 Impulse Control Disorders
Psych 199 Independent Study courses in this field, must culminate in a research paper to fulfill lab requirement (but do not count as upper-division psychology courses towards the major).

Concentration in Cognitive Psychology and Cognitive Neuropsychology

a. The cognitive area studies reasoning, thinking, language, judgment, and decision-making in adults and children (including attention, memory, and visual and auditory information processing).
b. The cognitive neuropsychology area studies cognitive processes and their implementation in the brain. Cognitive neuroscientists use methods drawn from brain damage, neuropsychology, cognitive psychology, functional neuroimaging, and computer modeling.

Courses:

Psych 115 Lab / Cognitive Psychology
Psych 118 Lab 118A-B / Language Processing
Psych 119 Lab / Psycholinguistics
Psych 129 Logic of Perception
Psych 137 Social Cognition
Psych 141 Evolution and Human Nature
Psych 142 Psychology of Consciousness
Psych 144 Memory and Amnesia
Psych 145 Psychology of Language
Psych 148 Psychology of Judgment and Decision
Psych 152 Concepts of Intelligence
Psych 156 Cognitive Development in Infancy
Psych 161 Introduction to Engineering Psychology
Psych 187 Development of Social Cognition
Psych 199 Independent Study courses in this field, must culminate in a research paper to fulfill lab requirement (but do not count as upper-division psychology courses towards the major).

Concentration in Developmental Psychology

This area studies all aspects of human development with emphasis on social and personality development, perceptual development, and language acquisition. Also includes the study of developmental psychopathology.

Courses:

Psych 109 Lab / Applied Behavior Analysis
Psych 114 Lab/Psychophysiological Perspectives on the Social Mind
Psych 122 Aging
Psych 128 Practicum in Child Development
Psych 133 Brain and Cognitive Development
Psych 135 Evolutionary Principles/Animal Social Behavior
Psych 141 Evolution and Human Nature
Psych 145 Psychology of Language
Psych 152 Concepts of Intelligence
Psych 156 Cognitive Development in Infancy
Psych 168 Psychological Disorder of Childhood
Psych 172 Human Sexuality

Psych 180	Adolescence
Psych 185	Applied Developmental Psychology
Psych 187	The Development of Social Cognition
Psych 199	Independent Study courses in this field, must culminate in a research paper to fulfill lab requirement (but do not count as upper-division psychology courses towards the major).

(For additional qualifying courses, see the department's Student Affairs Office, 1533 Mandler Hall.)

Concentration in Sensation and Perception

This area studies how our sense organs and brain make it possible for us to construct our consciously experienced representation of the environment. Experiments using stimuli and computer control are used to test models of sensory or perceptual processes. Processes of particular interest include color vision, motion perception, and auditory illusions and paradox.

Courses:

Psych 125	Clinical Neuropsychology and Assessment
Psych 129	Logic of Perception
Psych 138	Sound and Music Perception
Psych 159	Physiological Basis of Perception
Psych 164	Mathematical Ideas in Psychology
Psych 169	Brain Damage and Mental Functions
Psych 182	Allusions and the Brain
Psych 199	Independent Study courses in this field, must culminate in a research paper to fulfill lab requirement (but do not count as upper-division psychology courses towards the major).

Concentration in Social Psychology

This area studyies human behavior in social situations, with specialization in such topics as emotion, aggression, social cognition, and aesthetics. It also encompasses applied social psychology, including psychology and the law and behavioral medicine.

Courses:

Psych 114	Lab/Psychophysiological Perspectives on the Social Mind
Psych 127	Applied Social Psychology
Psych 130	Delay of Gratification
Psych 131	Personality: Theory and Research
Psych 135	Evolutionary Principles/Animal Social Behavior
Psych 137	Social Cognition
Psych 139	Social Psychology of Sports
Psych 141	Evolution and Human Nature
Psych 149	Social Psychology of Theater
Psych 152	Concepts of Intelligence
Psych 153	Psychology of Emotion
Psych 155	Social Psychology and Medicine
Psych 157	Happiness
Psych 160	Groups
Psych 162	Psychology and the Law
Psych 172	Human Sexuality
Psych 175	Psychology and the Arts
Psych 178	Industrial Organization Psychology
Psych 186	Psychology and Social Policy
Psych 187	Development of Social Cognition
Psych 199	Independent Study courses in this field, must culminate in a research paper to fulfill lab requirement (but do not count as upper-division psychology courses towards the major).

Advising

Students are strongly encouraged to choose an adviser among the faculty. The Undergraduate Student Services Office will assist with the choice, office hours, or appointments. The student then plans her or his major program with the aid of the adviser. Such planning should take place in the student's sophomore year or as soon as possible thereafter.

Preparation for Graduate School

Regardless of the area of specialization that a student chooses to pursue, it is strongly advised that she or he obtain a strong general background in statistics and experimental methods through research with a faculty member. A recommended program of study to accomplish these goals is the following:

1. At least five courses from the group numbered Psychology 101–106 (Core Courses)
2. At least one laboratory course (Psychology 107, 109, 114, 118A, 118B, 119, 120/121, 120/140, 127)
3. Introduction to Statistics and Advanced Statistics (Psychology 60 and 111A-B)
4. The Senior Independent Research Project, Psychology 194A-B-C, as part of the Honors Program or the Research Project 196A-B-C.
5. Strongly recommended: Independent Studies (Psychology 199).

Quarterly, the Associated Students' U.S. Grants Program awards funds to undergraduate students' research independent of in-class projects. We encourage students to apply. Also, check the Web at http://orpheus.ucsd.edu/finaid/Scholarships/ucsdsch.htm, usgrants@ucsd.edu, and http://usgrants.ucsd.edu; or visit the U.S. Grants Office on the third floor of the Price Center room 3.346 for an application.

Preparation for Graduate School in Clinical Psychology

The above program is recommended for all students planning to go on to graduate school, including those interested in a clinical graduate program. Experience in research methodology and a general knowledge of psychology are considered the most important features and are preferred over a large number of courses in one particular area. Students are strongly advised **not** to take a large number of clinical courses in lieu of the recommended program of study listed above.

The Minors Program

The minor in psychology consists of at least twenty-eight units (seven four-unit courses), of which at least twenty units (five four-unit courses) must be upper-division. At least four courses have to be taken at UCSD.

If Psychology 60 (Statistics) is chosen as one of the lower-division courses, it, too, has to be taken for a letter grade. The application for a minor can be obtained from your college.

Education Abroad

Students are often able to participate in the UC Education Abroad Program (EAP) and UCSD's Opportunities Abroad Program (OAP) while still making progress toward the major. Students considering this option should discuss their plans with the director of Undergraduate Studies before going abroad, and courses taken abroad must be approved by the department. Information on EAP/OAP is detailed in the Education Abroad Program of the *UCSD General Catalog*. Interested students should contact the Program Abroad Office in the International Center.

Transfer Credit

In general, all introductory courses in experimental psychology are accepted for lower-division credit toward a psychology minor. Lower-division courses covering special topics in psychology (e.g., personal adjustment, human sexuality) will be accepted only if: 1) the student

had a general introductory course as a prerequisite, and 2) the student had satisfied this prerequisite before taking the special topics course. Advance Placement credit for Statistics is not sufficient for the psychology major. Upper-division psychology courses will be evaluated for transfer credit on a course by course basis.

Elementary School Teaching

Majoring in psychology offers excellent preparation for teaching in the elementary schools. If you are interested in earning a California teaching credential from UCSD, contact the Teacher Education Program (TEP) as early as possible in your academic career for information about the prerequisite and professional preparation requirements.

Major Requirements for the Integrated B.S./M.A.

An integrated program leading to a bachelor of science degree and a master of science degree in psychology is offered to those undergraduate students who are enrolled in any of the major programs offered in the Department of Psychology at UCSD. Qualified students are able to obtain the M.A. degree within one year following receipt of the B.S. degree. Students interested in applying to this program must meet with the B.S./M.A. adviser in the psychology student affairs office BEFORE the end of their junior year.

The program is open only to UCSD undergraduates. Psychology does not have financial aid available for students enrolled in this program.

Eligibility and Enrollment

To be eligible, students must have completed the first two quarters of their junior year in residence at UCSD and must have an overall UCSD GPA of at least 3.0 and students' major GPA should be at least 3.3. It is the responsibility of the prospective student to select a faculty member who would be willing to serve as the student's adviser and in whose laboratory the student would complete at least twenty-four units of research over a two-year period. Twelve of the twenty-four units of research Psychology 194A-B-C or 196A-B-C) must be completed during the student's senior undergraduate year and must be taken IN ADDITION to the requirements for the bachelor of science degree.

There are two applications:

1. In spring of the junior year, students apply to the integrated B.S./M.A. track if they fulfill above requirements.
2. In the spring of their senior year, they apply to the M.A. GREs are not required.

Requirements for the M.A.

For an M.A. in psychology, students must pick a concentration in one of six areas: Behavioral, Biological, Cognitive, Developmental, Sensation and Perception, and Social.

Students who have been approved (by both the Departmen of Psychology and UCSD Office of Graduate Studies) for the program must enroll in their graduate year in:

- Psychology 201A-B *Quantitative Methods,*
- Psychology 270A-B-C *Introduction to Laboratory Experimentation,*
- Four psychology seminars, two of which are in their area of concentration. In addition, three of the four seminars must be pro-seminars, which include:

  Psychology 217 *Developmental Psychology,*

  Psychology 218 *Cognive Psychology,*

  Psychology 219 *Behavioral Psychology,*

  Psychology 220 *Social Psychology,*

  Psychology 221 *Sensation and Perception,* and

  Psychology 222 *Behavioral Psychology.*
- one Psychology 500 *Teaching Instruction*

This amounts to forty units of graduate work. All courses must be completed with the grade of B^+ or better. All course work is to be approved by the advisers (forms available from the Undergraduate Students Affairs Office). Students are expected to meet the graduate requirements for the M.A. in *one year* (three consecutive, contiguous, academic quarters, beginning in the fall after graduation). Any deviation from this plan, such as a break in enrollment for one or more quarters, will cause the student to be dropped from the program.

All forms required for the program must be submitted and approved by the psychology undergraduate coordinator prior to each quarter of the graduate year. This includes the Application for Candidacy. Students must pay fees and be officially enrolled at UCSD during the quarter that the master's degree is to be awarded. The thesis draft should be submitted to the Office of Graduate Studies and Research for review before the final copy is officially submitted.

See the Undergraduate Students Affairs Office for further details.

The Graduate Program

The Department of Psychology provides broad training in experimental psychology. Increased specialization and the general burgeoning of knowledge make it impossible to provide training in depth in every aspect of experimental psychology, but most aspects are represented in departmental research.

Preparation

Apart from the general university requirements, the department generally expects adequate undergraduate preparation in psychology. A major in the subject, or at least a strong minor, is normally a prerequisite, but applicants with good backgrounds in such fields as biology and mathematics are also acceptable.

Language Requirements

There is no foreign language requirement.

Graduate Curriculum

All students must fulfill all course requirements (stated below) while registered as graduate students in psychology at UCSD. There may occasionally be exceptions granted to this rule. Requests for exception should be in the form of petitions from students and their advisers to the Committee on Graduate Affairs. It is in the best interest of the student if these petitions are forthcoming at the time of admission to the graduate program. In this way, the committee, the students, and their advisers will all be aware of the course requirements before any of them are taken.

Program of Study

Courses are divided into six areas: *behavior analysis* (including basic and applied), *biopsychology* (including neuropychology and neurophysiology), *cognitive* (including attention, language, and perception), *developmental* (including language acquisition), *sensation and perception* (including vision and audition), and *social* (including health and law). The Graduate

Affairs Committee provides an approved list of courses from these areas. In the first year of study, each student must fulfill the following four requirements:

1. Each student must fulfill a quantitative methods requirement, either by taking two quantitative methods courses approved by the Graduate Affairs Committee (currently 201A and 201B), or by showing a satisfactory knowledge of these courses through an examination.
2. In addition to the quantitative methods requirement, each student is expected to take four proseminars and four approved courses from the list prepared by the Graduate Affairs Committee. All course work must be completed by the end of the third year.
3. Each first-year graduate student is required to submit a research paper on the research project (Psychology 270ABC). The paper should be comparable in style, length, and quality to papers published in the normal, refereed journals of the student's research area. (The publication manual of the American Psychological Association, fourth edition, 1995, gives an acceptable format.)

   The research paper will be read and evaluated by the student's research adviser and by at least two other readers appointed by the graduate adviser.

   The research paper is presented orally at a research meeting held at the end of the spring quarter. Attendance at this meeting is a requirement for the department's graduate students and faculty. Typically, each student is allowed ten minutes to present the paper, with a five-minute question period following the presentation.
4. A teaching requirement must be met. (see below)

   All students are evaluated by the entire faculty at the end of the academic year. The normal minimum standards for allowing a student to continue beyond the first year are:

   a. satisfactory completion of the first-year research project (including oral presentation),
   b. at least a B+ in the quantitative methods courses,
   c. a B+ average in the courses which fulfill the area requirements, and
   d. having a faculty adviser in the psychology department.

Any student whose needs cannot be reasonably met with courses conforming to these guidelines is encouraged to petition the Graduate Affairs Committee. The petition should contain a specific list of courses and a statement of justification and must be approved by the student's adviser.

Advancing to Candidacy

In order to advance to Ph.D. candidacy a student must:

1. Complete all first year requirements,
2. Complete an additional four elective courses from the list prepared by the Graduate Affairs Committee, and
3. Complete the qualifying examination for the Ph.D.

The qualifying examination is divided into two sections to be taken separately by all students. *Part I* of the qualifying exam consists of a paper written by the student that is modeled after those published in *Psychological Bulletin* or *Psychological Review*. Ideally, the paper would consist of a detailed review and theoretical synthesis of a coherent body of research. The paper should demonstrate independent and original thinking on the part of the student, and should either take a theoretical stance or recommend experiments designed to resolve theoretical ambiguities (i.e., the paper should not merely review published research).

Students form a qualifying committee in much the same way that they form a dissertation committee. The same rules apply, except that members from outside the department need not be included (although up to two may be). Once the committee is formed, the student should prepare a brief (e.g., three pages) proposal defining the area of research and the theoretical issues that will be addressed in the paper. A proposal meeting is then arranged (usually in spring quarter of the student's second year), and committee members may at that time recommend changes in the scope of the paper and define their expectations.

The paper does not have a prescribed length, although low-end and high-end limits of thirty and fifty pages, respectively, seem reasonable. An oral defense of the paper is required (and should be completed by the end of the student's third year).

Part II of the qualifying examination is the defense of the dissertation proposal. This will normally follow *Part I* of the qualifying examination and will be an oral examination including outside examiners.

Teaching

In order to acquire adequate teaching experience, all student are required to participate in the teaching activities of the department for at least four years (one quarter for the first year and two quarters the second through the fourth year).

Residency

Each student must complete the requirements for qualification for candidacy for the Ph.D. degree by the end of the third year of residence. Any student failing to qualify by this time will be placed on probation. A student who fails to qualify by the end of the spring quarter of the fourth year of residence will automatically be terminated from the department.

No students may allow more than eight calendar years to elapse between starting the graduate program and completing the requirements for the Ph.D. degree. Students will automatically be terminated from the program at the end of the spring quarter of their eighth calendar year in the department.

Research

In each year of graduate study all students are enrolled in a research practicum (Psychology 270 in the first year; Psychology 296 in subsequent years). Students are assigned to current research projects in the department and recieve the personal supervision of a member of the staff.

Departmental Ph.D. Time Limit Policies

Students must be advanced to candidacy by the end of four years. Total university support cannot exceed eight years. Total registered time at UCSD cannot exceed eight years.

COURSES

LOWER-DIVISION

Experimental Requirements

Psychology at UCSD is a laboratory science. We are concerned with the scientific development of knowledge about human and animal

behavior and thought. Accordingly, experience with experimental procedures plays an important role in the undergraduate and graduate training of students.

All psychology majors must learn experimental methods, including basic statistical techniques. Students in the Honors Program must take laboratory courses and also do a year-long undergraduate thesis.

ATTENTION lower-division students: Students enrolled in the lower-division psychology courses *must* serve as experimental subjects for three hours per course. The requirement is intended to be a positive educational supplement to the course work. Part of each experimental session will be devoted to explanation and discussion of the purpose and nature of the experiment. This usually will be done at the end of the experimental session. Students always have the right to discontinue participation at any point in any study. Students who are unable to participate or who choose not to participate will be provided alternate service assignments which are designed to serve similar educational goals.

1. Psychology (4)
A comprehensive series of lectures covering the basic concepts of modern psychology in the areas of human information processing, learning and memory, motivation, developmental processes, language acquisition, social psychology, and personality.

2. General Psychology: Biological Foundations (4)
A survey of physiological and psychological mechanisms underlying selected areas of human behavior. Emphasis will be upon sensory processes, especially vision, with emphasis also given to the neuropsychology of motivation, memory, and attention.

3. General Psychology: Cognitive Foundations (4)
This course is an introduction to the basic concepts of cognitive psychology. The course surveys areas such as perception, attention, memory, language, and thought. The relation of cognitive psychology to cognitive science and to neuropsychology is also covered.

4. General Psychology: Behavioral Foundations (4)
This course will provide a basic introduction to behavioral psychology, covering such topics as classical conditioning, operant conditioning, animal learning and motivation, and behavior modification.

6. General Psychology: Social Foundations (4)
This course will provide a basic introduction to social psychology, covering such topics as emotion, aesthetics, behavioral medicine, person perception, attitudes and attitude change, and behavior in social organizations.

60. Introduction to Statistics (4)
Introduction to the experimental method in psychology and to mathematical techniques necessary for experimental research. *Prerequisite: one year mathematics or consent of instructor.*

87. Freshmen Seminar (1)
The Freshman Seminar Program is designed to provide new students with the opportunity to explore an intellectual topic with a faculty member in a small seminar setting. Freshman seminars are offered in all campus departments and undergraduate colleges, and topics vary from quarter to quarter. Enrollment is limited to fifteen to twenty students, with preference given to entering freshmen. *Prerequisites: none.*

90. Undergraduate Seminar (1)
This seminar introduces the various subdisciplines in psychology and their research methods, and also explores career and graduate school opportunities. This includes informal presentations by faculty, graduate students, and other professionals.

99. Independent Study (2,4)
Independent study or research under direction of a member of the faculty. *Prerequisites: lower-division standing, completion of at least thirty units of undergraduate study at UCSD with a minimum UCSD GPA of 3.0; completed and approved Special Studies form.*

UPPER-DIVISION

101. Introduction to Developmental Psychology (4)
A lecture course on a variety of topics in the development of the child, including the development of perception, cognition, language, and sex differences. *Prerequisite: Psychology 60*

102. Introduction to Sensation and Perception (4)
An introduction to problems and methods in the study of perception and cognitive processes. *Prerequisite: Psychology 60*

103. Introduction to Principles of Behavior (4)
An example of the principles of conditioning and their application to the control and modification of human behavior.

104. Introduction to Social Psychology (4)
An intensive introduction and survey of current knowledge in social psychology. *Prerequisite: Psychology 60*

105. Introduction to Cognitive Psychology (4)
Introduction to experimental study of higher mental processes. Topics to be covered include pattern recognition, perception, and comprehension of language, memory, and problem solving. *Prerequisite: junior standing.*

106. Introduction to Physiological Psychology (4)
Intensive introduction to current knowledge of physiological factors in learning, motivation, perception, and memory.

107. Lab/Substance Abuse Research (4)
This lab course examines theory and research design and methods for substance abuse is adolescent adult populations. This course serves as preparation for individual research topics culminating in a paper.

109. Lab/Applied Behavior Analysis (4)
This course will provide students with hands-on training in the application of behavioral research technology to a clinical population. Students will meet weekly for lecture, discussion, research article reviews, and specific technique training. In addition, students will work on a research project. *Prerequisite: Psychology 199 in the Schreibman Autism Laboratory recommended.*

110. Juniors Honors Research Seminars (4)
Meetings consist of research seminars by a range of departmental faculty, exposing students to contemporary research problems in all branches of experimental psychology. Class discussions will follow faculty presentations. Evaluation is based on assigned papers. *Prerequisites: admission by application with a minimum UCSD GPA of 3.3. Department stamp required.*

111A. Research Methods I (6)
Designed to provide training in the applications of advanced statistical methods in the context of initial instruction in experimental design. Emphasis will be placed on the development of statistical problem-solving skills, practical computer applications, and scientific report writing. *Prerequisites: minimum grade of B in Psychology 60 or equivalent and junior standing. Open to honors students or consent of instructor. Department stamp required.*

111B Research Methods II (6)
Designed to extend the material of Psychology 111A. Focusing on the techniques developed previously. Participate in data collection, data organization, statistical analysis, and graphic displays, emphasis placed on developing scientific report writing, presentations, and critical thinking about experimental methods. *Prerequisite: Psychology 111A or consent of instructor.*

114. Laboratory in Psychophysiological Perspectives on the Social Mind (4)
Lab course on the use of psychophysiological methods to investigate "the social mind," or the cognitive and emotional processes involved in understanding and reacting to other people. Overview of major research topics and methods applying selected techniques in actual experiments. Students will engage in developing individual research questions to actively participate in designing and conducting the experiments. *Prerequisite: upper-division standing.*

115. Laboratory in Cognitive Psychology (4)
Lecture and laboratory work in human information processing. *Prerequisite: Psychology 105 and 111A-B or consent of instructor.*

118A. Real-Time Examination of Language Processing (4)
This lab course examines the design and methods for the real-time examination of language processing in normal and disordered (aphasic, dyslexic, child language impaired, etc.) language populations. This course serves as preparation for individual research topics in Psychology 118B. *Prerequisite: a course in language or cognition (see professor for exceptions).*

118B. Real-Time Examination of Language Processing (4)
This lab is a continuation of Psychology 118A. The instruction to laboratory methods is now applied to individual research projects culminating in a lab presentation and paper. *Prerequisite: Psychology 118A or consent of instructor.*

119. Psycholinguistics/Cognition Laboratory (4)
Methods and practicum in experimental study of language, reading, and related cognitive processes (reasoning, problem solving) in young adult populations. *Prerequisites: A course in language or cognition, or Psych 118A-B (see professor for exceptions). Permission of instructor required. Department stamp required.*

120. Learning and Motivation (4)
Survey of research and theory in learning and motivation. Includes instincts, reinforcement, stimulus

control, choice, aversive control, and human application. *Prerequisites: upper-division standing. Must be taken concurrently with Psychology 121.*

121. Laboratory in Operant Psychology (4)
Lecture and laboratory in operant psychology. *Prerequisite: must be taken concurrently with Psychology 120.*

124. Introduction to Clinical Psychology (4)
Introduction to major concepts and models used in psychological assessment and psychotherapeutic intervention. Several modalities of psychotherapy (individual, group, and family) will be reviewed along with research on their efficacy. *Prerequisite: Psychology 163.*

125. Clinical Neuropsychology and Assessment (4)
A fundamental grounding in basic neuropsychological principles and assessment methods, neuroanatomical, and cognitive relationships, with special emphasis on imaging technologies in diagnosis and prognosis. Neuropsychological testing methods are discussed in terms of statistical reliability, validity, and applications to neurologic/psychiatric populations. *Prerequisite: Psychology 60.*

127. Methods in Applied Social Psychology (4)
Emphasizes learning of experimental and quasi-experimental methodology applicable to social problems. Students carry out field research in areas such as the psychology of law (judicial decision-making), traffic-related behavior (risk taking), environmental psychology, and other areas of student interest. *Prerequisites: Psychology 104 and 60.*

128. Practicum in Child Development (6)
[Same as COHI 116 and HDP 135] A combined lecture/laboratory course for students in psychology, communication, and human development. Student backgrounds should include a background in general psychology or communication. Students will be expected to spend four hours a week in a supervised practical after school setting at one of the community field sites involving children. Additional time will be devoted to readings and class prep, as well as six hours a week transcribing field notes and writing a paper on some aspect of the field work experience as it relates to class lectures and readings. *Prerequisites: Psychology 101 or COGN 20 or HDP1 or consent of instructor.*

129. Logic of Perception (4)
Lectures will cover three topics: 1) tradition of experimental work on perception that dates back to Hemholtz; 2) discussion and criticisms of theories of perception; 3) recent physiological work on the visual pathways that may give us insights into neural mechanisms underlying perception. *Prerequisite: upper-division standing.*

130. Delay of Gratification (4)
This course will review the research on delay of gratification. It will cover what makes it in general so tough, what situations make it possible, who can do it, and what the implications of this ability are. *Prerequisite: upper-division standing.*

131. Personality: Theory and Research (4)
Introduction to major theoretical approaches to the study of personality constructs and processes. Disturbances in personality development and functioning will be discussed and illustrated. The social learning theory perspective will be emphasized relative to other theoretical frameworks. *Prerequisite: upper-division standing.*

132. Hormones and Behavior (4)
A survey of the effects of chmical signals (hormones, neurohormones and pheromones) on behavior as well as reciprocal effects of behavior on these chemical systems. Specific topics covered include aggression, sex and sexuality, feeding, learning, memory and mood. Animal studies will be emphasized. *Prerequisite: Psychology 106 or consent of insturctor.*

133. Circadian Rhythms—Biological Clock (4)
Examples and fundamental properties of the daily biological clock in humans, animals and microbes. Experimental approaches employed to understand how organisms keep time and how this applies to human health. *Prerequisite: Psychology 106 or BILD 1 or consent of instructor.* This course is cross-listed with BIMM 116.

134. Eating Disorders (4)
This course will cover the biology and psychology of eating disorders such as anorexia nervosa, bulimia nervosa, and binge eating disorder. Abnormal, as well as normal eating will be discussed from various perspectives including endocrinological, neurobiological, psychological, sociological, and evolutionary. *Prerequisite: upper-division standing.*

135. Animal Behavior (4)
Mechanisms that regulate the behavior of animals, including neural, endocrine, genetic, and environmental mechanisms, with a strong emphasis on evolution (natural and sexual selection). Topics include communication, sociality, mating strategies, and parental behavior. *Prerequisite: upper-division standing.*

136. Cognitive Development (4)
Examination of the foundations and growth of mind, discussing the development of perception, imagery, concept formation, memory, and thinking, with emphasis on the presentation of knowledge in infancy and childhood. *Prerequisite: Cognitive Science 110B, Psychology 105 or 101.*

137. Social Cognition (4)
Social cognition blends cognitive and social psychology to investigate how people make sense of the social world. Social perception, inference, memory, motivation, and affect, understanding of the self, stereotypes, and cultural cognition. *Prerequisite: upper-division standing.*

138. Sound and Music Perception (4)
Topics include the physiology of the auditory system, perception and pitch, loudness and timbre, localization of sound in space, perception of melodic and temporal patterns, handedness correlates, and musical illusions and paradoxes. There will be a substantial number of sound demonstrations. *Prerequisite: upper-division standing.*

139. Social Psychology of Sports (4)
This course focuses on the applications of social psychological principles and finding to the understanding of sports. Topics include the role of motivation, level of aspiration, competition, cooperation, social comparison, and optimal arousal, spectators' perspective, motivation and perceptions of success, streaks, etc. *Prerequisite: upper-division standing or consent of instructor.*

140. Lab/Human Behavior (4)
Laboratory on the principles of human behavior, including choice behavior, self-control, and reasoning. *Prerequisites: 120 (may be taken concurrently); upper-division standing.*

141. Evolution and Human Nature (4)
Can important aspects of human behavior be explained as a result of natural selection? Focus on sex differences, selfishness and altruism, homicide and violence, and context effects in human reasoning. *Prerequisite: upper-division standing and consent of instructor.*

142. Psychology of Consciousness (4)
This course will survey research on consciousness from an experimental psychology perspective. Special emphasis will be placed on cognitive, neuro-imaging, and clinical/psychiatric investigative techniques, and on the scientific assessment of the mind-body problem. *Prerequisites: Recommended Psychology 1 (or equivalent) and 60. Psychology 105 and/or 106 are useful but not necessary.*

143. Control and Analysis of Human Behavior (4)
An overview of the behavioral approach including basic principles, self-control, clinical applications, and the design of cultures. *Prerequisite: upper-division standing.*

144. Memory and Amnesia (4)
This course will review basic research into the nature of memory. It begins with an examination of historical milestones in the study of memory and then considers research concerned with contemporary models of memory and amnesia. *Prerequisite: upper-division standing.*

145. Psychology of Language (4)
Introduction to research on language comprehension and production. Focus on brain basis of language, language origin and universal structure, language disorders (aphasia, dyslexia), animal language, linguistic community differences, and the mental processes underlying normal language processing. *Prerequisite: a course in language, cognition, or philosophy of mind recommended.*

147. Gender (4)
This interactive undergraduate seminar will examine biological approaches to gender differences and sexuality. Do the biosciences further our understanding of these issues? How are biological claims embraced or rebutted by other disciplines? Students will read primary scientific literature and criticism. *Prerequisite: department stamp.*

148. Psychology of Judgment and Decision (4)
Broadly defined, the field of judgment and decision making examines preferences and subjective probability, and how they are combined to arrive at decisions. The course will cover history and current topics. *Prerequisite: upper-division standing*

149. Social Psychology of Theater (4)
Exploration of the relationship between social psychology and drama, focusing on the use of psychological principles in plays (by playwrights) and their performance (by directors, actors, and choreographers). *Prerequisites: upper-division standing, major in psychology or theater, or permission of instructor.*

151. Tests and Measurement (4)
This course provides an introduction to psychological testing presented in three components: 1) psychometrics and statistical methods of test construction; 2) application of psychological tests in industry, clinical practice, and other applied settings; and 3) controversies in the application of psychological tests. *Prerequisite: Psychology 60.*

152. Conceptions of Intelligence (4)
This course will examine the concept of intelligence from several perspectives: its historical development, its measure in terms of IQ test, and its role in practical affairs. Also included will be its role in comparative psychology and attempts to analyze intelligence in terms of more fundamental cognitive processes. *Prerequisite: Psychology 60 or consent of instructor.*

153. Psychology of Emotion (4)
Past and current findings and theories on emotion. Facial expressions of emotions, psychophysiology, evolutionary perspectives, and specific emotions: anger, fear, and jealousy. *Prerequisites: upper-division standing and Psychology 104, or consent of instructor.*

154. Behavior Modification (4)
Extension of learning principles to human behavior, methods of applied behavior analysis, and applications of behavioral principles to clinical disorders and to normal behavior in various settings. *Prerequisite: upper-division standing.*

155. Social Psychology and Medicine (4)
Explores areas of health, illness, treatment, and delivery of treatment, and social psychological perspectives in the medical area. *Prerequisite: Psychology 60 or equivalent and 104.*

157. Happiness (4)
This course will address the psychology of happiness. The discussions and readings, consisting largely of original research articles. Will explore such questions as: what is happiness? How do we measure it, and how do we tell who has it? What is the biology of happiness and what is its evolutionary significance? What makes people happy—youth, fortune, marriage, chocolate? Is the pursuit of happiness pointless? *Prerequisite: upper-division standing.*

159. Physiological Basis of Perception (4)
A survey of sensory and perceptual phenomena and the physiological mechanisms underlying them. *Prerequisite: Psychology 102 or consent of instructor.*

160. Groups (4)
Causes and consequences of gregariousness, stress, validating attitudes, improving efficiency, consolidating power, permitting loafing, rejecting deviates, and insulating group members from unpleasant outside influence. *Prerequisite: upper-division standing.*

161. Introduction to Engineering Psychology (4)
Surveys human perceptual and cogntive limitaitons and abilities important in designing "user-friendly" computers and devices, improving aviation and traffic safety, and other engineering challenges. Topics include human vision as it bears on display design (including virtual-reality), short-term memory limitations, learning and practice, effects of noise and stress, causes of human error and their minimization. Acceptable as elective for ECE and ESE students. *Prerequisite: upper-division standing.*

162. Psychology and the Law (4)
Studies the psychological factors in the legal system, applying psychological theory and methods to the criminal justice system, identifying crime and criminals, eyewitness reliability, bail setting, plea bargaining, sentencing, and parole. An original research project will be required as part of the course. *Prerequisite: Psychology 60 and 104.*

163. Abnormal Psychology (4)
Surveys origins, characteristics and causes of abnormal behavior and the biological and environmental causes of abnormality. *Prerequisite: upper-division standing.*

164. Mathematical Ideas in Psychology (4)
This course will survey how mathematical ideas have been applied in modeling psychological processes and in analyzing psychological data. Topics include signal detection theory, perceptual encoding, scaling techniques, and neural models of perceptual and cognitive processes. *Prerequisite: Calculus: one quarter, linear algebra desirable.*

166. History of Psychology (4)
Surveys major trend and personalities in development of psychological thoughts. Emphasis given to such topics as mind-body problem, nativism vs. empiricism, and genesis of behaviorism. *Prerequisite: concurrently enrolled in Honors Thesis 194A-B-C.*

167. Social and Emotional Development (4)
Focuses on topics like attachment, moral development, sex roles, self-definition, and peer interaction. *Prerequisite: Psychology 60 and 101.*

168. Psychological Disorders of Childhood (4)
Explores different forms of psychological deviance in children (psychosis, neurosis, mental retardation, language disorders and other behavior problems). Emphasis on symptomatology, assessment, etiological factors, and various treatment modalities. (Offered every other year.) *Prerequisite: upper-division standing.*

169. Brain Damage and Mental Functions (4)
Studies neural mechanisms underlying perception, memory, language, and other mental capacities. What happens to these capacities when different parts of the brain are damaged? What can we learn about the normal brain by studying patients? *Prerequisite: upper-division standing.*

172. The Psychology of Human Sexuality (4)
Important issues in human sexuality including sex and gender, sexual orientation, reproductive technology, and sexual dysfunction. *Prerequisite: upper-division standing.*

175. Psychology and the Arts (4)
An interdisciplinary course focusing on theoretical ideas and empirical research that relate contemporary psychology (social and cognitive, psychophysiology, motivation and emotion) to issues in various aesthetic and artistic domains, as visual arts, music, literature, criticism, and the performance arts. *Prerequisite: upper-division standing; major in Psychology, Music, Visual Arts, Communications, or Literature, or permission of instructor.*

178. Organizational Psychology (4)
Examines human behavior in industrial and organizational settings. Psychological principles are applied to selection, placement, and training. The effectiveness of individuals and groups within organizations, including leadership and control, conflict and cooperation, motivation, and organizational structure and design, is examined. *Prerequisite: upper-division standing.*

179. Drugs, Addiction, and Mental Disorders (4)
Considers the use, abuse, liability, and psycho-therapeutic effects of drugs in humans. Lectures are supplemented by guest lecturers from clinical experts in psychology and psychiatry. *Prerequisite: one lower-division psychology course (1, 2, 3, or 4) or upper-division standing.*

180. Adolescence (4)
This course will adopt a multidisciplinary approach toward understanding the period of human adolescence. A strong focus on the neurobiological aspects of adolescence will be combined with psychological, anthropological, and sociological considerations. *Prerequisite: upper-division standing.*

181. Drugs and Behavior (4)
Psychological effects, brain mode of action, patterns of use of psychoactive agents, including stimulants, sedative/hypnotic, hallucinogens, marijuana, alcohol, over-the-counter drugs, cognitive enhancers, antianxiety agents, antidepressants, antipsychotics, and basic principles in psychopharmacology. *Prerequisite: upper-division standing.*

182. Illusions and the Brain (4)
This course explores the bases of illusions in terms of perceptual and cognitive principles, and the underlying brain mechanisms; extensive demonstrations are included. *Prerequisite: upper-division standing.*

184. Choice and Self-Control (4)
Experimental analysis of choice behavior, with an emphasis on the types of choice involved in self-control. Focus on conditions under which decision-making is optimal. *Prerequisite: upper-division students in psychology, biology, economics, or consent of instructor.*

185. Applied Developmental Psychology (4)
This seminar course deals with how developmental psychologists conduct scientific studies that have direct practical implications for children's well-being. Major issues to be discussed are: child witnesses, literacy, school violence, impact of media on child development, and developmental psychopathology. *Prerequisite: upper-division standing.*

186. Psychology and Social Policy (4)
This course will examine social policy issues from the psychological point of view. Each social policy issue will be discussed in a descriptive manner and will include (with student input) an array of both pro and con arguments. The psychological (behavioral) assumptions in the pro and con arguments will then be identified and the empirical evidence for these assumptions will be analyzed. *Prerequisite: Psychology 60 and 104.*

187. Development of Social Cognition (4)
This course will examine reasoning about people from a developmental perspective. Topics will include emotional understanding, achievement motivation, peer relations, social categories, and culture. *Prerequisites: upper-division standing. Department stamp required.*

188. Impulse Control Disorders (4)
Problems of impulse control are important features of major psychiatric disorders but also of atypical impulse control disorder such as: pathological gambling, compulsive sex, eating, exercise, shopping. Focus: development, major common features, treatment, and neurobiological basis of impulse control disorders. *Prerequisite: upper-division standing.*

194A-B-C. Honors Thesis (4-4-4)
Students will take part in a weekly research seminar. In addition, they will plan and carry out a three-quarter research project under the guidance of a faculty member. The project will form the basis of the senior honors thesis. *Prerequisite: acceptance to the Honors Program in the junior year (110A-B) (GPA 3.3), in addition one laboratory course (114-127) or two 199s which culminate in a research paper (by petition only) and Psychology 110, 111A-B and consent of instructor.*

195. Instruction in Psychology (4)
Introduction to teaching a class section in a lower-division psychology course, hold office hours, assist with examinations and grading (P/NP grades only). This course counts only once towards the major. *Prerequisite: junior or senior psychology major with GPA of 3.0 or an A in the course and consent of instructor.*

196 A-B-C Research Seminar (4-4-4)
Weekly research seminar, three quarter research project under faculty guidance which culminates in a thesis. *Prerequisite: one laboratory course, 3.3. GPA , and/or consent of instructor.*

199. Independent Study (2 or 4)
Independent study or research under direction of a member of the faculty. *Prerequisite: GPA 2.5 and 90 units completed. (P/NP grades only.) Not counted for credit towards the major. See Section on 199 information.*

2XX. Graduate Seminar
We encourage Juniors and Seniors meeting the suggested criteria of an overall 3.0 GPA to enroll in Graduate Seminars. Check the schedule of classes and contact the Student Affairs Office on how to enroll.

GRADUATE

201A-B-C. Quantitative Methods in Psychology (4-4-4)
An intensive course in statistical methods and the mathematical treatment of data, with special reference to research in psychology. *Prerequisite: restricted to graduate students in psychology.*

204. Neurobiology of Social Development (4)
The goal of this class is to acquaint students with research on the neurological underpinnings of social and social cognitive development. Students will be expected to become familiar with the existing research in the area, and to understand the neural structures that comprise the limbic system, and their developmental timecourse. Students will be expected to form hypotheses about the neural correlates of aspects of social development based upon an understanding of the development of structures involved in social behavior.

206. Mathematical Modeling (4)
This course is designed to teach the basics of mathematical modeling. Topics include when, why, and how to use signal detection theory (an essential theory for anyone interested in attention, perception, memory, or decision making), how to analyze reaction time distributions (instead of simply measuring mean RT), how to engage in the fine art of model comparison, and how to avoid creating models that are more complex than the data they seek to explain.

208. Seminar on Hormones and Behavior (4)
A survey of the affects of chemical signals (hormones, neurohormones, and pheromones) on behavior as well as reciprocal effects of behavior on these chemical systems. Specific topics covered include aggression, sex and sexuality, feeding, learning, memory and mood. Animal studies will be emphasized.

209. Topics in Judgment and Decision Making (3)
This seminar examines issues in the psychology of judgment and decision making. Topics include the heuristics and biases approach, over confidence, framing effects, intertemporal choice, and rationality.

210. Skill Acquisition and Development of Expertise (4)
The course examines the transition from novice to highly skilled performance and the transfer of that skill to novel problems and contexts. Emphasis will be on information processing accounts of learning and performance for relatively simple cognitive tasks.

211. The Development of Social Cognition (3)
This seminar will cover the development of concepts about people. Topics include emotional understanding, "theory of mind," trait thinking, social categories, psychological essentialism, achievement motivation, and social and cultural influences on person perception.

212. Current Topics in Visual Science (3)
Each year a different topic in visual science is selected for in-depth review and discussion based on current readings. *Prerequisite: consent of instructor.*

213. Professional Procedures and Survival in Psychology (3)
This course provides a forum for presentation and discussion of the basic issues associated with surviving in a professional (particularly, academic) psychology environment. It covers such issues as: 1) how to get a job; 2) how to keep a job; 3) general issues in professional survival. The course will include the presence of a number of the psychology faculty in topic specific areas (e.g., journal editors from our faculty; faculty sitting on grant review panels, etc.). The issue of ethics will be examined and discussed relative to each topic raised.

214. Applied Developmental Psychology (4)
This seminar deals with how developmental psychologists conduct scientific studies that have direct practical implications for children's well-being. Major issues to be discussed are: child witnesses, literacy, school violence, impact of media on child development, and developmental psychopathology.

215. Language Acquisition (4)
Discussion of the acquisition of language by young children, including such topics as its stages, mechanisms, and relation to nonlinguistic development.

217A. Proseminar in Developmental Psychology I (3)
The course examines cognitive development through the school-age period. It begins with an examination of early neurological, sensory, motor, and perceptual functions and then focuses on issues in linguistic and cognitive development.

217B. Proseminar in Developmental Psychology II (3)
The course examines social and personality development from infancy through early adolescence. The class will first discuss general developmental theory and methods and then topics such as attachment, temperament, self-concept, aggression, family relations, play, and peers.

218A-B. Cognitive Psychology (3-3)
A two-quarter survey of basic principles and concepts of cognitive psychology. This course is intended to serve as the basic introduction for first-year students. Basic areas include knowledge, memory, thought, perception, and performance. The areas are taught by faculty members who work within the specialty. *Prerequisite: graduate status in psychology or consent of instructor.*

219. Proseminar in Learning and Motivation (3)
An overview of the experimental and applied analysis of behavior including topics such as the principles of operant and classical conditioning, stimulus control, choice, conditioned reinforcement, aversive control, biological and economic contexts, verbal behavior, and the modification of human behavior in a variety of applied settings.

220. Proseminar in Social Psychology (3)
An introduction to social psychology. Psychology and the law, health psychology, attitudes, emotions, person perception and aggression are some of the topics to be covered.

221. Proseminar in Sensation and Perception (3)
Fundamentals of vision, audition, and other senses. Emphasis will be upon psychophysical approaches to the study of these sensory modalities, as well as some essential aspects of their neurophysiological bases.

222. Biological Psychology (3)
A survey of the functional neuroanatomical, neurodevelopmental, neurophysiological, and pharmacological correlates of psychological phenomena.

223. Advanced Topics in Vision (4)
An in-depth analysis of empirical and theoretical issues in a specialized area of vision or visual perception. Emphasis most likely will be on a topic of ongoing vision research at UCSD. *Prerequisite: Psychology 212 or special consent of instructor.*

224. Parental Behavior: Evolution and Mechanisms (4)
This course will broadly address evolutionary, endocrine, psychological, and neurobiological aspects of parental behavior. Topics will include the social/environmental factors which promote parental care, the role of steroid and peptide hormones in parental care, and the evolutionary forces that promote different patterns of paternal and maternal investment in young. *Prerequisite: a basic understanding of brain function.*

225. Topics in Neural Timing (4)
This seminar will introduce fundamentals in chronobiology research and then address specific problems in greater detail. Proposed topics include oscillator coupling, masking, circannual rhythms, photoperiodism, and non-photic influences on circadian rhythms. The seminar will read classic and contemporary literature.

226. Color Appearance Models: Cognition and Perception (3)
This course covers color appearance models (e.g., CIE models, OSA, etc.) and their use in perception and cognition research. Emphasis will be given to the theories underlying color appearance spaces; the derivation and interpretation of corresponding "metrics"; color-difference tolerances; plausible linking propositions for color models and neurophysiology; and the ways these models are used in psychological and psychophysical experimentation.

227. Gender and Development (4)
Topics will include methodology, gender differences, culture, the development of knowledge of sex roles, stereotype formation, gender as a social category, and the role of gender in peer relationships, family relationships, and achievement motivation. Gender development will be approached from different perspectives within psychology, including developmental, cognitive, and social. The course will draw from areas outside of psychology, including anthropology and sociology.

228. Conceptions of Intelligence (3)
This course surveys major issues in the study of intelligence. Issues to be considered are the structure of intelligence, its heritability, and significance for real-world behavior. Special emphasis will be given to accounts of intelligence based on elementary processes.

229. Happiness (4)
This course will address the psychology of happiness. The discussions and readings, consisting largely of

original research articles, will explore such questions as: What is happiness? How do we measure it, and how do we tell who has it? What is the biology of happiness and what is its evolutionary significance? What makes people happy–youth, fortune, marriage, chocolate? Is the pursuit of happiness pointless?

233A. Topics in Learning and Motivation (3)
Advanced topics in learning and motivation, with special emphasis on current research. *Prerequisite: Psychology 210.*

234. Memory and Amnesia (3)
This course traces the history of research into animal and human short-term memory. Classic models, current viewpoints, and their attendant epistemological presuppositions will be considered. The relationship between empirical analyses of memory in animals and humans will also be reviewed.

236. Substance Abuse (3)
Theory and research on the development, progression, and resolution of substance use and abuse will be reviewed and evaluated. Normal and abnormal patterns of substance involvement will be contrasted across the life span.

237. Human Rationality (4)
The traditional view of rationality is based upon abstract, content-independent rules for behavior. People sometimes violate these rules in a laboratory setting, but the violations are often systematic and appear to reflect adaptation to the environment outside the laboratory. Such findings raise questions about what it means to be rational. Readings will be empirically oriented and cover the areas of deductive reasoning, inductive reasoning, and choice.

239. Psychology of Sport (3)
This seminar will focus on the applications of social psychological principles and findings to the understanding of sports.

241. Groups (4)
This course examines the role of groups in buffering stress, validating attitudes, improving efficiency, consolidating power, permitting loafing, rejecting deviates, and insulating its members from unpleasant outside influence. *Prerequisite: consent of instuctor.*

242A-B-C. Research Topics in Developmental Psychology (4-4-4)
Advanced seminar concentrating on methods of research and current experimental literature. May be taken by undergraduate senior majors concurrently enrolled in Psychology 194. *Prerequisite: consent of instructor.* (S/U grades permitted.)

243. Sound and Music Perception (3)
This course will deal with anatomy and physiology of the ear, central auditory pathways, and neurological disorders of sound and music perception.

244. Special Topics in Psycholinguistics (4)
Discussion of the psychological reality of grammatical models, competence versus performance, learnability and innateness in theories of language acquisition, and questions of autonomy of "modularity" of grammatical versus semantic processing. Studies of lexical accessing, sentence comprehension, sentence production, and acquisition will all be considered, as well as some recent work in aphasia.

245. Aphasia (4)
Research and theory on language breakdown in brain-damaged adults is surveyed. Topics include an historical overview from linguistics, psycholinguistics, and neuroscience (especially brain imaging techniques). Credit may not be received for both Psychology 245 and Cognitive Science 251.

247. Neuroendocrinology of Social Variation (4)
Students will read and discuss primary literature on the general topic of how steroid and peptide hormones contribute to the production of social variation and diversity. This diversity includes seasonal variation, intersexual variation, and divergence between species in patterns of sociality and space use, pair-bonding and mating tactics, aggression, and use of communication signals.

249A-B-C. Advanced Topics in Applied Behavior Analysis (3-3-3)
Research and discussion on selected topics in applied behavior analysis.

251. Advanced Topics in Learning and Motivation (3)
Weekly meetings for graduate students actively engaged in research on conditioning. *Prerequisite: consent of instructor.*

252. Seminar on Cognitive Neuroscience (3)
This is a series of weekly seminars on current trends in neuropsychology. The seminars will deal with the concept of "localization" of function in different parts of the brain and the effects of damage to these parts on cognitive functions such as perception, memory and language. Active student participation will be encouraged in preparing these seminars

253. Cognitive Psychology and Cognitive Neuroimaging (4)
This seminar in cognitive neuroscience focuses on modern approaches to cognitive psychology as revealed through cognitive neuroimaging. A major goal of the course is to evaluate what (if anything) neuroimaging evidence has added to classic cognitive models/evidence in major areas of cognition (working memory, categorization, executive processes, decision-making, emotion, and memory).

254. Functional Brain Imaging (3)
Principles of magnetic resonance imaging (MRI) of the human brain, focusing on recently developed techniques for brain activation on mapping. Includes principles of NMR and imaging, anatomic MRI, and a detailed survey of functional imaging techniques and data analysis.

255A-B-C. Advanced Topics in Biological Psychology (3-3-3)
Research and discussion on selected topics in biological psychology.

258. Delay of Gratification (3)
This course will review the research on delay of gratification. We will cover what makes it in general so tough, what situations make it possible, who can do it, and what the implications of this ability are. We will draw from research in social, personality, and animal psychology as well as economics.

259. Social Psychology/Psycho-aesthetics (3)
This course will be an intensive examination of social psychology (legal decision-making, emotion, aggressive behavior) and the psychology of visual art and music (psycho-aesthetics).

260. Cognitive 'Subcultures': Methodologies and Analysis (3)
Several methods of systematic data collection (e.g., judged similarity, paired comparisons, direct scaling) and analysis (e.g., consensus modeling, principal components analysis, multidimensional scaling) are explored in a hands-on computer lab and reading seminar. The ways in which these methodologies and data handling techniques bear upon basic research issues in psychology will be illustrated, and differences in data structures arising from qualitative variation in subjects will be explored.

261. Proseminar in History of Psychology (3)
This course will consider the intellectual context in the nineteenth century from which psychology developed as an independent discipline. Emphasis will be on early German psychology and evolutionary theory. The second part of the course will consider the histories of different areas of psychology (e.g., behavioral, cognitive).

262. Functional Construction of the Vertebrate Brain's Social Behavior Network (4)
The vertebrate brain contains a network of strongly interconnected structures that play essential roles in the regulation of social behavior. In this seminar we will read and discuss primary literature that details the structure and behavioral functions of this network.

263. Psychopharmacology (3)
This course will explore the basic neuropharmacological mechanism of action of the major classes of drugs, including neuroleptics, stimulants, anti-depressants, minor and major tranquilizers, and sedative hypnotics. It will focus on the use of behavioral techniques for evaluating the neural mechanisms by which these drugs act.

264A-B-C. Advanced Topics in Language Processes (4-4-4)
Research and discussion on selected topics in language processes.

267A-B-C. Advanced Topics in Behavior Medicine (3-3-3)
Research and discussion on selected topics in behavior medicine.

268A-B-C. Advanced Topics in Experimental Psychopathology (3-3-3)
Research and discussion on selected topics in experimental psychopathology.

269A-B-C. Advanced Topics in Sound & Music Perception (3-3-3)
Research and discussion on selected topics in sound and music perception.

270A-B-C. Introduction to Laboratory Experimentatoin (1-4)
A basic laboratory course, designed to introduce first-year graduate students to experimental methods in psychology. The student will select a research topic, do a thorough literature review of the area, design and carry out new, original studies of problems in the selected area, and prepare a final formal report of the study at the end of the spring quarter. This course is required of all first-year graduate students in the department. *Prerequisite: first-year psychology graduate students only.*

272. Selected Topics in Cognitive Psychology (3)
An in-depth analysis of selected empirical and theoretical topics in cognitive psychology. The course will focus on areas where notable progress appears to be taking place in contemporary research.

280. Seminar in Communication and Information Processing (1)
(S/U grades only.)

296. Research Practicum (1-12)
Research in psychology under supervision of individual staff members. (S/U grades only.) (F,W,S)

298. Library Research (1-12)
Reports and surveys of the literature on selected topics. *Prerequisite: graduate students in psychology.* (S/U grades only.) (F,W,S)

299. Independent Research (1-12)
Independent research and thesis research. (S/U grades only.) (F,W,S)

500. Apprentice Teaching (4)
Required teaching practicum for students enrolled in graduate program in psychology. One four-unit course per year for four years. (S/U grades only.)

Public Health— Epidemiology

Office: Stein Clinical Research Building, Room 349
Mail Code: 0607

UCSD—http://www.medicine.ucsd.edu/fpm/epi/teaching.html#phd

SDSU—http://www-rohan.sdsu.edu/dept/gsph/departments/epidemiology.htm#topofpage

UCSD Faculty—http://medicine.ucsd.edu/fpm/epi/faculty.html

Doctoral Student Handbook (PDF download)—http://www-rohan.sdsu.edu/dept/gsph/student/student.htm

The Joint Doctoral Program (JDP)

The doctoral program in public health (epidemiology) was developed as a joint program in 1990 between the Department of Family and Preventive Medicine in the School of Medicine at the University of California, San Diego (UCSD), and the Graduate School of Public Health at San Diego State University (SDSU). Students in the program complete course work and conduct research at both institutions. Faculty from each campus serve on advisory and dissertation committees, providing students with extensive exposure to experts whose research interests represent the interdisciplinary nature of modern public health. Dr. Deborah Wingard (UCSD) and Dr. Stephanie Brodine (SDSU) codirect the program. Dr. Richard Shaffer (SDSU) serves as overall program coordinator.

Requirements for the joint doctoral degree include:

1. successful completion of required course work
2. passing written preliminary examinations in epidemiology and biostatistics
3. passing written and oral qualifying examinations
4. demonstrating proficiency in two computer-based statistical software packages
5. demonstrating proficiency in teaching
6. completion and successful formal defense of a dissertation

Typical areas of emphasis include infectious disease epidemiology, chronic disease epidemiology, cancer epidemiology, behavioral epidemiology, community-based trials, physical activity/exercise/nutrition and health. San Diego is ideally located in a large and ethnically diverse metropolitan center bordering Mexico and the Pacific Rim, enabling students to carry out population-based multicultural and multinational studies of health problems.

Time Limits

The goal of this policy is to encourage Ph.D. completion in a timely manner.

Pre-candidacy limit. Maximum registered time to advance to Ph.D. candidacy: 4 years

Support limit. Maximum registered time doctoral student is eligible for support: 6 years

Total time limit. Maximum registered time to complete all Ph.D. requirements: 7 years

Information regarding admission is found in the current edition of the *Bulletin of the Graduate Division of San Diego State University.* To receive an application for admission, contact SDSU/UCSD Joint Doctoral Program in Public Health, San Diego State University, 5500 Campanile Drive, San Diego 92182-4162, (619) 594-2743.

Public Health— Health Behavior

Office: Multipurpose Facility, UCSD Medical Center, Room L-041
Mail Code: 0807

UCSD—http://www.medicine.ucsd.edu/fpm/

SDSU—http://www-rohan.sdsu.edu/dept/gsph/departments/hp.htm

The Joint Doctoral Program (JDP)

A Ph.D. in public health with a concentration in health behavior is offered by the joint faculties of the Department of Family and Preventive Medicine in the School of Medicine at UCSD and the Division of Health Promotion, Graduate School of Public Health at San Diego State University (SDSU). Students in the program complete course work and conduct research at both institutions. Faculty from each campus serve on advisery and dissertation committees, providing students with extensive exposure to experts whose research interests represent the interdisciplinary nature of modern public health. Dr. Lawrence Palinkas (UCSD) and Dr. John Elder (SDSU) codirect the program.

Emphasis is on producing graduates with a mastery in the central concepts and analytic processes of health behavior. Graduates of the program are expected to establish advanced skills in applied behavioral analysis for population application; to establish expertise in advanced qualitative and quantitative research methods; to establish advanced skills in the application of interventions and research methods to health behavior in disenfranchised populations; and to establish skills necessary to understand and change health policy. Graduates of the program are competitive for a variety of research, teaching, and community service positions in areas such as academic institutions, local and state health departments, federal and international agencies, and both private and public-sponsored research institutions.

Requirements for the joint doctoral degree include:

1. successful completion of required course work
2. passing written preliminary examinations in behavioral science, epidemiology, and biostatistics
3. passing written and oral qualifying examinations
4. demonstrating proficiency in teaching
5. completion and successful formal defense of a dissertation

Areas of specialization currently include physical activity, tobacco control, skin cancer prevention, nutrition and obesity, HIV/AIDS, and tuberculosis prevention and control. An additional emphasis will be placed on methodologies, such as measurement and related research issues; and ecological approaches to understanding health behavior. San Diego is ideally located in a large and ethnically diverse metropolitan center bordering Mexico and the Pacific Rim, enabling students to carry out community-based multicultural and multinational studies of health problems.

Time Limits

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Public Service Minor

OFFICE: Office of the Provost
Thurgood Marshall College
Administration Building

Affiliated Faculty and Staff

Michael S. Schudson, Ph.D., *Communications, Director of Public Service Minor*
Linda Feldman, *Academic Internship Program, Director of Public Service Internships*

Specialization Chairs

Aurora Zepeda, M.P.A., *Teacher Education Program—Education*
Steven P. Erie, Ph.D., *Political Science—Government*
Lawrence A. Palinkas, Ph.D., *Family and Preventive Medicine, School of Medicine—Health*
Joel Robbins, Ph.D., *Anthropology—Social Issues*

The public service minor at UCSD encourages students to understand the history and practices of public service and to participate in the development of civic skills. Those skills and practices are essential cornerstones of participation in a democratic society regardless of one's chosen profession.

The course work for the minor emphasizes the history and emergence of the non-profit sector as a national institution distinct from the private and public sectors. The practicum aspects of the minor coupled with the traditional academic work encourages students to see the connection between the deeds of charitable service and the historic worth of citizen participation in the common public franchise regardless of professional interests or gain.

The minor in public service is open to all UCSD students in good standing. Students first complete TMC 15, Public Service in America, and must choose one area of specialization from education, government, social issues, or health. A list of specific courses has been comprised as appropriate for these specializations and is available through Marshall College Provost's Office. Approval of the minor is based on completion of TMC 15 and 2 of the 3 upper-division specialization courses with a 2.0 GPA or better and a cumulative GPA of 2.5 on 90 units. Students approved to complete the minor are placed into specific internships in public service through the Academic Internship Program.

The following 28 units comprise the public service minor:

TMC 15, Public Service in America

3 upper-division specialization courses (education, government, social issues, or health)

3 upper-division academic internships in public service

Capstone seminar in public service

For more information regarding the requirements for the minor, see the Office of the Provost, Thurgood Marshall College, TMC Administration Building.

Religion, Study of

OFFICE: Literature Building, third floor, room 3323
(858) 534-8849
Email: religion@ucsd.edu
Program Web site: http://religion.ucsd.edu/
Program Director: Fred Randel

Faculty

Nancy Caciola, *Associate Professor, History*
Suzanne Cahill, *Associate Adjunct Professor, History*
Steven Cassedy, *Professor, Literature*
Alain J.-J. Cohen, *Professor, Literature*
Richard S. Cohen, *Assistant Professor Literature*
Stephen D. Cox, *Professor, Literature*
Shalanda Dexter-Rodgers, *Assistant Professor, Ethnic Studies*
Arthur J. Droge, *Professor, Literature*
Page A. duBois, *Professor, Literature*
John H. Evans, *Associate Professor, Sociology*
David Noel Freedman, *Professor, History*
Richard E. Friedman, *Professor, Literature*
David Goodblatt, *Professor, History*
Jack Greenstein, *Associate Professor, Visual Arts*
Ramón Gutiérrez, *Professor, Ethnic Studies*
Marta Hanson, *Assistant Professor, History*
Marcel Henaff, *Professor, Literature*
Deborah Hertz, *Professor, History*
Alan Houston, *Associate Professor, Political Science*
Stephanie Jed, *Associate Professor, Literature*
David K. Jordan, *Professor, Anthropology*
Benetta W. Jules-Rosette, *Professor, Sociology*
Hasan Kayali, *Associate Professor, History*
Sanford A. Lakoff, *Professor Emeritus, Political Science*
Lisa Lampert, *Assistant Professor, Literature*
Edward N. Lee, *Professor Emeritus, Philosophy*
Richard P. Madsen, *Professor, Sociology*
John A. Marino, *Associate Professor, History*
Timothy McDaniel, *Professor, Sociology*
Alden A. Mosshammer, *Professor Emeritus, History*
Dana K. Nelkin, *Assistant Professor, Philosophy*
Sheldon A. Nodelman, *Professor, Visual Arts*
Esra Özyürek, *Assistant Professor, Anthropology*
Steven M. Parish, *Associate Professor, Anthropology*
William H. Propp, *Professor, History*
Fred V. Randel, *Associate Professor, Literature*
Edward Reynolds, *Professor Emeritus, History*
Joel Robbins, *Associate Professor, Anthropology*
Dylan Sailor, *Assistant Professor, Literature*
Gershon Shafir, *Professor, Sociology*
Melford E. Spiro, *Professor Emeritus, Anthropology*
Tracy B. Strong, *Professor, Political Science*
Christena Turner, *Associate Professor, Sociology*
Donald F. Tuzin, *Professor, Anthropology*
Oumelbanine Zhiri, *Professor, Literature*

Program Description

The program engages in the academic study of religious phenomena in many regions of the world and within many different religious cultures and traditions; and it studies literature, history, and society in relation to religion. Faculty and students associated with the program give primacy to humanistic and social scientific methods of study that have become established in the academic community during the nineteenth and twentieth centuries.

The location of the program in the Arts and Humanities Division and its use of courses from a variety of departments and divisions imply that neither the study of religion nor its data are the privileged possession of a single discipline. The hallmark of the program is its interdisciplinary and interdepartmental structure. At UCSD, faculty from the departments of Anthropology, History, Literature, Philosophy, Political Science, Sociology, and Visual Arts provide students with the opportunity to examine religious artifacts, texts, institutions, and communities within a particular cultural and historical context and in the context of comparable manifestations within the general history of religions.

A concentration in the Study of Religion aims at fostering a student's understanding of religion as one of the primary expressions of the human condition and as an historically powerful force in the shaping of human cultures; and it aims to foster an understanding of multiple religious traditions. It seeks to develop a student's appreciation of the difficulties and possibilities inherent in undertaking a critical, disciplined, cross-cultural study of religion.

Since the program endorses an interdisciplinary and comparative approach to the study of religion, lower-division preparation should be wide and varied. Lower-division courses in which religion figures prominently (e.g., Introduction to Religion, The Making of the Modern World, or the Revelle College Humanities Program), as well as courses which focus on textual and contextual analysis and employ the analytical tools and conceptual categories of the human sciences, would all be useful in preparing the student for a major in the Study of Religion. The program strongly encourages foreign language study. The ability to read the languages of original sources and of modern scholarship is highly recommended, especially for students planning to attend graduate school in religion.

Major

The major in the Study of Religion consists of twelve upper-division courses; achieving a balance between courses which focus on a single religious tradition or issue and those which explore various traditions and methodologies. These courses should include the following:

- two required courses in the Study of Religion, (1) RELI 110A or B and (2) RELI 112 or 113.
- ten courses from the approved course list to be selected in consultation with the program director. Students should see the program adviser for further details.

Double Major

Students may choose to pursue the Study of Religion as their second major. In such cases, it may be possible for up to two courses to overlap with the other major. Students should consult the program coordinator for further information.

Honors in the Study of Religion

The program for the Study of Religion offers an Honors Program for students who demonstrate excellence in the major. The minimum eligibility requirements for the Honors Program are stated below. In most cases students are completing their last two quarters (winter and spring) when they enroll in the honors program.

- completion of RELI 110A or 110B
- at least junior standing
- 3.5 GPA in the major and a 3.3 overall GPA
- eight units of RELI 196H taken over two quarters (typically winter and spring)
- research paper (at least 20 pages: most students write between 30–50 pages.)
- public presentation

Students interested in the Honors Program should consult with the program coordinator for a detailed list of requirements and an application. Participation in the Honors Program is contingent upon the prior approval of the Honors Thesis research topic by the director. Honors proposals are due at the Program Office by the tenth week of the quarter (usually fall quarter of the senior year) prior to being enrolled. Final approval must take place before the first day of the quarter in which the student plans to enroll in RELI 196H. The notations "distinction," "high distinction," and "highest distinction" will be determined on the following basis; major G.P.A., the grade for the research paper, and the grade for the public presentation.

Minor

The minor in the Study of Religion consists of seven courses, of which five must be upper-division. These seven courses must include two required courses in the Study of Religion as delineated under the major:

- RELI 110A or 110B

  and
- RELI 112 or 113.

Some students may apply two lower-division college requirements to the minor (e.g., Revelle students may apply HUM 1 and HUM 2, and ERC students may apply MMW 2 and MMW 3).

STUDENT ADVISING

All students are assigned a faculty adviser and are encouraged to meet with their adviser at least once a quarter to develop their course of study. Additional advising information may be obtained from the program coordinator, Literature Building, third floor, room 3323.

STUDY ABROAD

Students are encouraged to investigate the University of California Education Abroad Program (EAP) and other options for foreign study through the Opportunities Abroad Program (OAP). By petition, credits earned through EAP/OAP can fulfill major and minor requirements. More information about studying abroad can be obtained in the Education Abroad section of the catalog.

CAREER OPPORTUNITIES AND PREPARATION FOR GRADUATE STUDY

Among its many aims, the major in the Study of Religion is designed to develop fundamental skills in critical thinking, comparative analysis, research, and written expression. As such, the B.A. degree is appropriate for careers in education, government, business, and non-profit agencies. It is also an excellent preparation for graduate study in a variety of fields and disciplines.

Students interested in earning a California teaching credential from UCSD should contact the Teacher Education Program for further information.

Students are encouraged to consult the program director for further information about career opportunities and graduate study. Information is also available on the program's Web site.

COURSES

RELI 1. Introduction to Religion (4)
An introduction to key topics in the study of religion through a comparative reading of religious texts and/or artifacts. The intent is to develop basic strategies of interpretation for undertaking a critical, disciplined study of religion. (Not offered 2004–2005.)

RELI 110A. The Modern Study of Religion: Religion in Modernity (4)
This class examines the history of the term "religion," focusing upon the development of religion's contemporary significance within the Reformation and Enlightenment, and questioning what it means to be "modern." Topics change yearly. Special attention to contemporary culture and politics.

RELI 110B. The Modern Study of Religion: Social and Cultural Theories of Religion (4)
An introduction to basic strategies of interpretation in the study of religion, including issues of category formation, theory, and method. Special attention paid to prominent voices of the nineteenth and twentieth centuries, including Marx, Freud, Durkheim, Eliade, etc.

RELI 112. Texts and Contexts: The Holy Book in Judaism, Christianity, and Islam (4)
An introduction to the scriptures of Judaism, Christianity, and Islam, with the aim of providing a comparative perspective on the "bibles" of Western civilization.

RELI 113. Texts and Contexts: Textual Communities in South Asia (4)
This class considers important texts belonging to one or more of the following South Asian Traditions: Hinduism, Buddhism, Jainism, or Sikhism. It introduces students to the ways in which religious identities are formed and contested within a pluralistic society.

RELI 188. Special Topics in Religion (4)
Students in this lecture will investigate important problems in the study of religion or the history of particular religions. May be repeated for credit up to three times when topics vary. *Prerequisite: upper-division standing.*

RELI 189. Seminar in Religion (4)
This seminar requires the intensive analysis of critical problems in the study of religion or the history of particular religions. May be repeated for credit up to three times when topics vary. *Prerequisites: upper-division standing; RELI 110A or 110B.*

RELI 196H. Honors Thesis Research (4)
Honors thesis research for students accepted into the Honors Program. Research is conducted under the supervision of a program faculty member. *Prerequisite: program approval into the Honors program.*

RELI 197. Directed Advanced Readings (4)
A faculty member will direct a student in advanced readings on a topic not generally included in the Program for the Study of Religion's curriculum. Students must make arrangements with the program and individual faculty. May be repeated for credit up to three times for credit. *Prerequisites: upper-diviison standing; RELI 110A or 110B; overall GPA of 2.5.*

RELI 199. Independent Research Study for Undergraduates
Independent research in religion under the supervision of a faculty member affiliated with the Program for the Study of Religion. This course may be repeated three times with program approval. (P/NP grades only.) *Prerequisites: upper-division standing, with 2.5 GPA (overall); program stamp.*

APPROVED ELECTIVE COURSES

The following lower- and upper-division courses are offered on a regular basis, although not every course is available every year. Please contact the program coordinator for approved courses in any given quarter or visit the program's Web site, religion.ucsd.edu. Students may petition other courses, including independent study and Education Abroad Program courses when appropriate.

LOWER-DIVISION

ANLD 1. Introduction to Culture

HUM 1. The Foundations of Western Civilization: Israel and Greece

HUM 2. Rome, Christianity, and the Middle Ages

MMW 2. The Great Classical Traditions

MMW 3. The Medieval Heritage

PHIL 14. Introduction to Philosophy: Metaphysics

PHIL 31. History of Philosophy: Ancient Philosophy

RELI 1. Introduction to Religion

SOC 1A, B. The Study of Society

UPPER-DIVISION

METHODOLOGICAL

ANGN 120. Anthropology of Religion

ANGN 147. Ritual and Symbolism

ANGN 167. Rituals and Celebrations

SOCA 100. Classical Sociological Theory

SOCC 156. Sociology of Religion

GENERAL COMPARATIVE

ANGN 104. Anthropology of Fantasy

ANGN 135. Bodies and Boundaries: Symbols in Ritual and Everyday Life

ANGN 160. Nature, Culture, and Environmentalism

HISC 162. History of Science & Religion

LTWL 100. Mythology

LTWL 133. Religion, Inside Out & Upside Down

LTWL 143. Fundamentalism in Comparative Perspective

VIS 126F. Western & Non-Western Rituals & Ceremonies

RELIGION IN HISTORICAL CONTEXT

ANGN 184. Archaeology, Anthropology, and the Bible

ANRG 108. Hinduism

ANRG 150. The Rise & Fall of Ancient Israel

ANRG 173. Chinese Popular Religion

ETHN 161. Black Politics and Protest Since 1941

ETHN 188. African Americans, Religion, and the City

HIEA 126. The Silk Road in Chinese and Japanese History

HIEA 127. Chinese History of Medicine

HIEA 168. Topics in Classical and Medieval Chinese History

HIEA 121. Medieval Chinese Culture and Society

HIEU 101. Greece in the Classical Age

HIEU 105. The Early Christian Church

HIEU 106. The World of Late Antiquity

HIEU 107. History of Christianity from Fathers to Scholastics

HIEU 113. Rule, Conflict, and Dissent in the Middle Ages

HIEU 140. Mystics, Popes, and Peasants: Early Modern Catholicism and Society

HIEU 161. Topics in Roman History: Christianity in the Roman Empire

HIEU 163. Special Topics in Medieval History

HINE 100. The Ancient Near East and Israel

HINE 102. The Jews in Their Homeland in Antiquity

HINE 103. The Jewish Diaspora in Antiquity

HINE 104. The Bible & the Near East: The Primary History

HINE 105. The Bible & the Near East: The Prophets

HINE 106. The Bible & the Near East: The Writings

HINE 107. Ancient Egypt: History and Culture

HINE 108. The Middle East Before Islam

HINE 114. The History of the Islamic Middle East

HINE 161. Seminar in the Hebrew Bible

HINE 170. Special Topics in Jewish History

HINE 186. Special Topics in Middle Eastern History

HIRE 115. Women in Chinese Religions

HITO 102. East Asian Religious Traditions

HITO 104. Jews & Judaism in the Ancient & Medieval Worlds

HITO 105. Jews & Judaism in the Modern World

HIUS 155A/B. Religion and Law in American Society

JUDA 110. Introduction to Judaism

LTWL 131A. The New Testament

LTWL 131B. Paul & the Invention of Christianity

LTWL 131C. Reinventing Jesus

LTWL 131D. The Fourth Gospel

LTWL 131E. The History of Heresy

LTWL 131F. Christianity and the Roman Empire

LTWL 131G. Against the Christians

LTWL 134. A Cultural History of American Jewry

LTWL 139. Gnosticism: The Religious Underground from Late Antiquity to the New Age

LTWL 142. Islam: The Origin and Spread of a World Religion

RELIGION AND SOCIETY

ANGN 100. Special Topics in Socio-Cultural Anthropology (when topic covers Religion)

ANRG 122. Peoples and Cultures of the Middle East

ANRG 170. Traditional Chinese Society

ETHN 110. Cultural World Views of Native Americans

ETHN 189. Special Topics in Ethnic Studies (when topic covers religion)

HIEA 119. Religion and Popular Culture in East Asia (SOCB 162R)

HIEA 120. Classical Chinese Philosophy & Culture

HIEA 137. Women and Family in Chinese History

HIEU 110. The Rise of Europe

HIEU 111. Europe in the Middle Ages

HIEU 125. Reformation Europe

HIEU 163. Topics in Medieval History: Saints in Social Context

HILA 106. Religion in Latin America

HINE 118. The Middle East in the 20th Century

HINE 166. Nationalism in the Middle East

HISC 101B. Medieval Science in the Latin West, ca. 500-1500

LTWL 136. Goddesses and Women in India

LTWL 141. Islam and Modernity

POLI 110A. Citizens & Saints: Political Thought from Plato to Augustine

POLI 110B. Sovereign Subjects in the Modern State: Machiavelli to Rousseau

POLI 110C. Revolution & Reaction: Political Thought from Kant to Nietzsche

POLI 121. Government and Politics of the Middle East

SOCB 122. Jerusalem: Sacred and Profane

SOCB 160. Sociology of Culture

SOCB 162R. Religion and Popular Culture in East Asia (HIEA 119)

SOCC 154. Religious Institutions in America

SOCC 157. Religion in Contemporary Society

SOCD 158. Islam in the Modern World

SOCD 158J. Religion and Ethics in China and Japan

SOCD 188A. Community and Social Change in Africa

SOCD 188B. Chinese Society

SOCD 188F. Modern Jewish Societies and Israeli Society

SOCD 189. Special Topics in Comparative-Historical Sociology: Chinese Society in Transition

RELIGION AND LITERATURE

HINE 160. Special Topics in the Bible and Ancient Near East

JUDA 100. Introduction to the Hebrew Bible

LTEN 106. Chaucer's Contemporaries

LTEN 118. Milton

LTEN 120D. William Blake and the Age of Sensibility

LTEN 125B. First-Generation Romantic Poets: Wordsworth, Rousseau, and Burke

LTEN 147. Metamorphoses of the Symbol: Mountains From Moses to Muir

LTEN 149. Themes: New Testament and English and American Literature

LTEU 100. The Classical Tradition: Myths of Ancient Greeks & Romans

LTEU 105. Medieval Studies: Dante

LTNE 100. The Bible & Western Literature

LTNE 101. The Bible: The Narrative Books

LTNE 102. The Bible: The Prophetic Books

LTNE 103. The Bible: The Poetic Books

LTNE 150. Arabic Literature in Translation

LTWL 135. The Buddhist Imaginary

LTWL 138. Critical Religion Studies

LTWL 145. South Asian Religious Literature: Selected Topics

RELIGION AND PHILOSOPHY

LTWL 101. What Socrates Knew

PHIL 104. The Rationalists

PHIL 130. Metaphysics

PHIL 131. Topics in Metaphysics

PHIL 185. Philosophy of Religion

RELIGION AND THE ARTS

HIEU 124. The City in Italy (VIS 122E)

THHS 103. Ancient Greek Drama in Modern Version

VIS 120A. Greek Art

VIS 120B. Roman Art

VIS 120C. Late Antique Art

VIS 121B. Castles, Cathedrals & Cities

VIS 121D. The Illuminated Manuscript in the Middle Ages

VIS 122AN. Renaissance Art

VIS 122D. Michelangelo

VIS 122E. The City in Italy (HIEU 124)

VIS 123AN. Between Spirit & Flesh: Northern Art of the Early Renaissance

VIS 124BN. Art & the Enlightenment

VIS 126BN. The Art and Civilization of the Ancient Maya

VIS 128BN. Topics in Early Modern Art History: The City of Rome: The Making of a Christian Capital

Revelle College

OFFICE: Office of the Provost, Revelle College
http://revelle.ucsd.edu

Humanities/Writing Program

OFFICE: Galbraith Hall 180, Revelle College
See Humanities Program for Revelle Writing.

Revelle Honors Program

OFFICE: Office of the Provost, Revelle College

Particularly well-prepared students are invited to join a freshman honors program, which includes weekly participation in small faculty seminars (Revelle 20). Acceptance into the Honors Program at admission is automatic for Regents and National Merit Scholars as well as those students entering with a high school GPA of 3.8 or higher and verbal and math SAT scores of 700 or higher. Admission to the program winter quarter is offered to those who achieve a 3.7 GPA in at least twelve graded units taken at UCSD during the fall quarter. A variety of other perquisites are also awarded. Outstanding students are individually advised to participate in small honors classes in chemistry, mathematics, physics, and social science.

Outstanding seniors are selected for participation in honors seminars, Revelle 100 and 110. At least five outstanding graduating seniors are honored at graduation each year with a monetary honorarium.

An honors banquet is given for the top 200 students (from all class levels) in Revelle each spring.

Revelle 20. Revelle Honors Seminar (0)
Weekly seminars with a faculty member (chosen each year by the provost to match the interests of participating students). This seminar will acquaint students with the scholarship and research being conducted by faculty and instill in students a sense of participation in the scholarly life at UCSD. *Prerequisite: by invitation only. Pass/Not Pass grades only.* (F,W,S)

Revelle 100. Senior Honors Seminar: Science and Civilization (4)
Beginning with the distinction between science and technology, the course will trace their evolution from earliest times, culminating in an examination of their impact on modern society and of the social concerns about their future course. *Prerequisites: senior standing, 3.5 overall GPA, science major, consent of instructor, Revelle students only. Pass/Not Pass grades only.*

Revelle 110. Senior Honors Seminar: Thinking About Science (4)
A seminar for honors students concerning the nature of science and its place in our society. The course will consist of readings and discussions concerning a range of historical, philosophical, and sociological perspectives on science. *Prerequisite: Revelle College senior honors students.*

Revelle Seminars

OFFICE: Office of the Provost, Revelle College

Revelle Seminars 90 (1.0 unit credit) are sponsored by Revelle College to promote student/ faculty interaction in a small group setting.

Revelle 90. Undergraduate Seminar (1)
A seminar intended for exposing undergraduate students, especially freshmen and sophomores, to exciting research programs conducted by the faculty. *Prerequisite: none. Pass/Not Pass grades only.* (F,W,S)

Revelle 91. Art, Book, and Life (1)
This interdisciplinary seminar will look at some selective relationships between visual arts and literature generally building chronologically and culminating with slide-illustrated visits to the world's great museums. Short student presentations. *Prerequisite: Humanities or consent of instructor.*

Russian and Soviet Studies

OFFICE: 3024 Humanities and Social Sciences Building, Muir College
Web site: http://orpheus.ucsd.edu/history/RussianSovietStud.html

Faculty

Steven Cassedy, Ph.D., *Professor in Literature*
Frantisek Deak, Ph.D., *Professor in Theatre*
Robert Edelman, Ph.D., *Professor in History*
Timothy McDaniel, Ph.D., *Professor in Sociology*
Philip Roeder, Ph.D., *Associate Professor in Political Science*
Rebecca Wells, *Lecturer in Literature*

Russian and Soviet Studies is an interdisciplinary program that provides a broad range of courses in the history, language, literature, and social and political life of Russia (before, during, and after the Soviet period). It is designed for students who do not wish to restrict their Russian studies to literature.

The Minor

The minor consists of seven courses, at least four of which must be upper-division. In addition, there must be at least one course each from two of the three following areas: literature, history, and social science. No more than three of the seven courses may be language courses. Knowledge of the language is not a requirement for the minor, but it is strongly recommended.

The Major

The major requires a study of Russian language. It consists of LTRU 1A-B-C (First-Year Russian), LTRU 2A-B-C (Second-Year Russian), or their equivalent, and a minimum of twelve upper-division courses. All students are required to take LTRU 104A-B-C (Advanced Practicum in Russian), HIEU 134 (History of Russia, Ninth Century to 1855), HIEU 156 (History of Russia, 1855 to the Present), and LTRU 110A-B-C (Survey of Russian Literature in Translation). In addition, students will take four electives, of which at least two must be from the social sciences (sociology or political science).

Students in the major are encouraged to participate in the Education Abroad Program (EAP) in Russia and to investigate other options for foreign study through the Opportunities Abroad Program (OAP). By petition, credits earned through EAP/OAP can fulfill UCSD degree and major requirements. Please visit the Web site at http://orpheus.ucsd.edu/icenter/pao for further details.

COURSES

LITERATURE

LTRU 1A-B-C First-year Russian (4-4-4)
LTRU 2A-B-C Second-year Russian (4-4-4)
LTRU 101A-B-C Advanced Russian (4-4-4)
LTRU 104A-B-C Advanced Practicum in Russian (4-4-4)
LTRU 110A-B-C Survey of Russian and Soviet Literature in Translation (4-4-4)
110A 1800–1860
110B 1860–1917
110C 1917–present
LTRU 123 Single Author in Russian Literature (4)
LTRU 128 Single Author in Soviet Literature (4)
LTRU 129 Twentieth-Century Russian or Soviet Literature in Translation (4)
LTRU 130 Genres in Russian Literature (4)
LTRU 131 Russian Short Fiction (4)
LTRU 132 Russian Poetry (4)
LTRU 150 Russian Culture: The Modern Period (4)
LTRU 198 Directed Group Study (4)
LTRU 199 Special Studies (2 or 4)

HISTORY

HIEU 134 Russia: Ninth Century to 1855 (4)
HIEU 156 Russia: 1855 to the Present (4)
HIEU 157 Early Soviet Social History (4)
HIEU 178 Special Topics in Modern Russian History (4)

SOCIOLOGY

Soc/D 188E Soviet Society

POLITICAL SCIENCE

POLI 130AA Soviet Politics and After
POLI 130B The Soviet State and Society
POLI 130C Seminar: Soviet Politics

Science Studies

OFFICE: 3008 Humanities and Social Sciences Building, Muir College
http://sciencestudies.ucsd.edu/

Director, Naomi Oreskes

Professors

William Bechtel, Ph.D., *Philosophy*
Michael Bernstein, Ph.D., *History*
Geoffrey Bowker, Ph.D., *Communication*
Nancy Cartwright, Ph.D., *Philosophy*
Paul M. Churchland, Ph.D., *Philosophy*
Gerald D. Doppelt, Ph.D., *Philosophy*
Chandra Mukerji, Ph.D., *Communication and Sociology*
Andrew Scull, Ph.D., *Sociology*
Susan Leigh Star, Ph.D., *Communication*
Robert S. Westman, Ph.D., *History*

Professor Emeritus

Martin J.S. Rudwick, Ph.D., *History*

Associate Professors

Craig Callender, Ph.D., *Philosophy*
Lisa Cartwright, Ph.D., *Communication*
Steven Epstein, Ph.D., *Sociology*
Martha Lampland, Ph.D., *Sociology*
Naomi Oreskes, Ph.D., *History*
Eric Watkins, Ph.D., *Philosopy*

Assistant Professors

Marta E. Hanson, Ph.D., *History*
Andrew Lakoff, Ph.D., *Sociology*

Lecturer

Mark Hineline, Ph.D., *History*

Affiliated Faculty

Charles Briggs, Ph.D., *Ethnic Studies*
Roddey Reid, Ph.D., *Literature*

The Science Studies Program at UCSD is a Ph.D. program committed to working toward a deeper understanding of scientific knowledge and technological change, past and present. The program offers students an opportunity to integrate the perspectives developed in communication studies and the history, sociology, and philosophy of science, while receiving a thorough training at a professional level in one of the component disciplines. Students enrolled in the program choose one of the four disciplines for their major field of specialist studies and are required to complete minor field requirements in the others. Students are also required to take the Introduction to Science Studies, and two interdisciplinary, topical "core" seminars, and to attend the program colloquium. Science studies students are encouraged to select dissertation topics that offer scope for a cross-disciplinary approach. The Ph.D. will be awarded in "Communication (Science Studies)," "History (Science Studies)," "Sociology (Science Studies)," or "Philosophy (Science Studies)." In special circumstances, students may be permitted to work for the M.A. degree.

COURSES

GRADUATE

HIGR 236A-B. Seminar in History of Science (4-4)
A two-quarter research seminar, comprising intensive study of a specific topic in the history of science. The first quarter will be devoted to readings and discussions; the second chiefly to the writing of individual research papers. The topic varies from year to year, and students may repeat the course for credit. (IP grade to be awarded the first quarter; final grade will be given at the end of the second quarter.) *Prerequisite: graduate standing.*

COGR 201I. Ethnography of Information Systems (4)
This course will survey the rapidly growing body of ethnographic analyses of information systems, to extend the basic principles of ethnographic research and to lead students in the development of projects modifying these principles for the emerging electronic environment. Students may approach the course in one (or both) of two ways—either preparing for and carrying out a pilot ethnographic study or studying the theoretical literature in depth.

HIGR 237. Topics in the History of Earth and Ocean Sciences (4)
Intensive study of specific problems in the history of the ocean sciences and of related earth and atmospheric sciences in the modern period. Topics vary from year to year, and students may therefore repeat the course for credit. *Prerequisite: graduate standing or consent of instructor.*

COGR 225A, HIGR 238, PHIL 209A, SOCG 255A. Introduction to Science Studies (4)
Study and discussion of classic work in history of science, sociology of science, and philosophy of science, and of work that attempts to develop a unified science studies approach. Required for all students in the Science Studies Program. *Prerequisite: enrollment in Science Studies Program.*

COGR 225B, HIGR 239, PHIL 209B, SOCG 255B. Seminar in Science Studies (4)
Study and discussion of selected topics in the science studies field. Required for all students in the Science Studies Program. The topic varies from year to year, and students may, therefore, repeat the course for credit. *Prerequisite: enrollment in Science Studies Program.*

COGR 225C, HIGR 240, PHIL 209C, SOCG 255C. Colloquium in Science Studies (4)
A forum for the presentation and discussion of research in progress in science studies, by graduate students, faculty, and visitors. Required for all students in the Science Studies Program. *Prerequisite: enrollment in the Science Studies Program.*

HISC 160/260. Historical Approaches to the Study of Science (4)
This colloquium course will introduce students to the rich variety of ways in which the scientific enterprise is currently being studied historically. Major recent publications on specific topics in the history of science selected to illustrate this diversity will be discussed and analyzed; the topics will range in period from the seventeenth century to the late twentieth, and will deal with all major branches of natural science. Requirements will vary for undergraduate, M.A., and Ph.D. students. Graduate students may be expected to submit a more substantial piece of work. *Prerequisites: consent of instructor; department stamp required.*

HISC 162/262. Problems in the History of Science and Religion (4)
Intensive study of specific problems in the relation between science and religion. The problems may range in period from the Renaissance to the twentieth century. Topics vary from year to year. Requirements will vary for undergraduate, M.A., and Ph.D. students. Graduate students may be expected to submit a more substantial piece of work. *Prerequisites: upper-division standing; department stamp required.*

HISC 164/264. Topics in the History of the Physical Sciences (4)
Intensive study of specific problems in the physical (including chemical and mathematical) sciences, ranging in period from the Renaissance to the twentieth century. Topics vary from year to year, and students may therefore repeat the course for credit. Requirements will vary for undergraduate, M.A., and Ph.D. students. Graduate students may be expected to submit a more substantial piece of work. *Prerequisites: consent of instructor; department stamp required.*

HISC 165/265. Topics in Twentieth-Century Science and Culture (4)
This is a seminar open to advanced undergraduates and graduate students that explores topics at the interface of science, technology and culture, from the late nineteenth century to the present. Topics change yearly; may be repeated for credit with instructor's consent. Requirements vary for undergraduates, M.A., and Ph.D. students. Graduate students are required to submit a more substantial piece of work. *Prerequisites: upper-division standing or consent of instructor; department stamp.*

HISC 166/266. The Galileo Affair (4)
Galileo's condemnation by the Catholic Church in 1633 is a well-known but misunderstood episode. Was Galileo punished for holding dangerous scientific views? Personal arrogance? Disobedience? Religious transgressions? Readings in original sources, recent historical interpretations. Graduate students will be expected to submit a more substantial piece of work. *Prerequisites: upper-division standing or consent of instructor.*

HISC 167/267. Topics in the History of Medicine (4)
Intensive study of specific problems in the history of medicine. Topics will vary from year to year, and students may therefore repeat the course for credit. Requirements will vary for undergraduate, M.A., and Ph.D. students. Graduate students may be expected to submit a more substantial piece of work. *Prerequisite: department stamp required.*

HISC 168/268. The Extraterrestrial Life Question (4)
The changing fortunes of the belief in the existence of life beyond the Earth (pluralism) from 1750–present as it evolved from a marginal speculation to a central scientific question with wide-ranging consequences for traditional religious belief systems. *Prerequisites: upper-division standing or graduate standing or consent of instructor. Graduate students will be expected to submit a more substantial piece of work.*

Soc. 225. Madness and Society (4)
An examination of the historical and sociological literatures on the relationship between madness and society, focusing primarily on the United States and Great Britain but with some comparative reference to western Europe.

Soc. 236. Contemporary Topics in the Sociology of Science (4)
This seminar will cover current books and theoretical issues in the sociology of science. Topics will vary from year to year. May be repeated three times for credit.

Soc. 237. Historical Sociology of Science (4)
In recent years the sociology of science and the history of science have developed increasingly close links and shared projects. Those include the detailed naturalistic study of actual scientific practice, the analysis of the social construction of scientific knowledge in particular social settings, and the examination of relationships between the moral economy of scientific sites and the status of the knowledge produced there. Particular attention will be paid to the identity of peculiarly historical and sociological perspectives. Technical problems concerning the deployment of sociological frameworks in historical study will be addressed. Students will read and assess a range of recent work in which the connection between sociology and history of science is most evident.

Soc. 238. Relativism and the Sociology of Science (4)
A critical survey of theoretical and empirical sociological work advocating a relativist perspective on scientific knowledge. Special attention is paid to the characterization of different relativist genres, to the debates between relativism, realism and rationalism, and to the empirical grounding of relativism in studies of scientific controversy and closure.

Soc. 277. The Sociology of Technology (4)
Social theory has been largely uninterested in technology. The major exceptions are to be found in the evolutionary

stories concerning "man the tool maker." The aim of the seminar is to review the literature in paleontology, philosophy of technology, and technology on the link between tools and social theory. The idea of the seminar is to test ideas coming from sociology of technology, ethology, and evolutionary scenarios, and anthropology of tool use, in order to make room in social theory for artifacts.

Phil. 204A. Core Course in Philosophy of Science (4)
An introduction to one or more central problems in the philosophy of science, or in the philosophy of one of the particular sciences, such as the nature of confirmation and explanation, the nature of scientific knowledge, reductionism, the unity of science, or realism and antirealism. May be taken for credit three times with changed content.

Phil. 212. Contemporary Topics in the Philosophy of Science (4)
This seminar will cover current books and theoretical issues in the philosophy of science. Topics will vary from year to year. *Prerequisite: Philosophy 180, or equivalent, or consent of instructor.*

Phil. 245. Philosophy of Science (4)
This seminar will cover current books and theoretical issues in the philosophy of science. May be taken for credit seven times with changed content.

Phil. 247. Philosophy of Biology (4)
Historical and contemporary perspectives on foundational issues about biology. May include questions about the nature of biological explanation, the relation of biology to chemistry and physics, the status of attributions of function, and the relation of biology to the social sciences. May be taken for credit six times with changed content.

Phil. 250A. Philosophy of the Cognitive Sciences (4)
Contemporary debates about the study of the mind-brain as studied in one or more of the empirical cognitive sciences. May include questions about the different strategies of explanation invoked, the conceptions of representation employed, the connections between theoretical models developed. May be taken for credit six times with changed content.

Science, Technology, and Public Affairs

OFFICE: Galbraith Hall, Room 180, Revelle College

The program offers an opportunity to study the important social policy issues that lie at the intersection of science, technology, and decision making and to develop awareness of the social and political factors that condition technology on the social order. The program will be attractive to students anticipating careers in law, administrative sciences, science, engineering, business, and international affairs. The program will serve as a meeting place for those interested in approaching policy questions from the perspective of the physical and biological sciences and for those in the social sciences having an interest in the scientific and technological component of present social, political, and environment problems.

COURSES

LOWER-DIVISION

35. Society and the Sea (4)
Introduction to the oceans and their relationship to humankind. Selected topics include ocean-related science, engineering, research, economics, and international relations (emphasizing countries of the Pacific Rim); living and nonliving resources; coastal zone management; military and social aspects; and the sea in weather and climate. *Prerequisite: none.* (F)

UPPER-DIVISION

181. Elements of International Medicine (4)
The sociocultural, ecomomic, and geopolitical framework for the study and understanding of medical problems on a worldwide scale, and as basis for international health policy. Global patterns of disease, availability and needs for medical technology, and comparisons between diverse medical education and health care delivery systems abroad with those in the U.S. Students should be able to acquire an understanding of diverse determinants of disease, and of relationships between socioeconomic development and health. *Prerequisite: senior or graduate standing.* H. Simon (W)

199. Special Project (2 or 4)
Directed study on topics in science, technology, and public affairs; especially for Warren College students. (P/NP grades only.) *Prerequisite: senior standing.*

RELATED COURSES

Courses in other departments (change somewhat from year to year):

Economics 130

MAE 110B, 118A, 118B, 118C

Political Science 138D

Political Science 154

Political Science 160AA

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Political Science 161

Political Science 167A,B

Sociology 168E

Scripps Institution of Oceanography

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http://www-siograddept.ucsd.edu/

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Gustaf Arrhenius, Ph.D., *Oceanography*
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Douglas H. Bartlett, Ph.D., *Marine Microbiology*
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Glenn R. Ierley, Ph.D., *Geophysics*
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Detlef Stammer, Ph.D., *Oceanograpy*
Dariusz Stramski, Ph.D., *Oceanography*
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Charles S. Cox, Ph.D., *Oceanography*
Joseph R. Curray, Ph.D., *Geology*
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Konstantine P. Georgakakos, Sc.D., *Hydrology*
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Dan Lubin, Ph.D., *Research Physicist*
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R. Glenn Northcutt, Ph.D., *Neurosciences*
Sutanu Sarkar, Ph.D., *Professor, MAE*

The graduate department of Scripps Institution of Oceanography offers instruction leading to Ph.D. degrees in oceanography, marine biology, and earth sciences. Although students are not admitted specifically for an M.S. degree, it is possible to obtain an M.S. on the way to completing the Ph.D. program. A graduate student's work normally will be concentrated in one of the curricular programs within the department: applied ocean science, biological oceanography, climate sciences, geosciences, geophysics, marine biology, marine chemistry and geochemistry, and physical oceanography.

No undergraduate major is offered in the department though most courses in the department are open to enrollment for qualified

undergraduate students with the consent of the instructor. The UCSD Earth Sciences Undergraduate Program offers an earth sciences major leading to a B.S. or a combined B.S./M.S. degree. The interdisciplinary nature of research in marine and earth sciences is emphasized; students are encouraged to take courses from various UCSD departments, and to consider interdisciplinary research projects.

The Curricular Programs

Applied Ocean Science is a multidisciplinary program focused on the application of advanced technology to ocean exploration and observation. AOS students perform research in marine acoustics, optics, electromagnetics, geophysics, ecology, sediment transport, coastal processes, physical oceanography, and air-sea interaction. The emphasis is on the resolution of key scientific issues through novel technological development. The science focus of the Scripps AOS program is complemented by parallel Applied Ocean Science programs in both the Mechanical and Aerospace Engineering (MAE) and Electrical and Computer Engineering (ECE) departments. Students have access to professors, courses, and research facilities across all three departments.

Biological Oceanography is concerned with the interactions of populations of marine organisms with one another and with their physical and chemical environment. Because these interactions are frequently complex, and because the concepts and techniques used are drawn from many fields, biological oceanography is, of necessity, interdisciplinary. Therefore, studies in physical oceanography, marine chemistry, marine geology, and several biological areas are pertinent.

Research is conducted on space/time scales ranging from short-term interactions between individual organisms (mm., sec.) to interdecadal variation in widely dispersed populations. The techniques used in these investigations are diverse, and can include field observation and manipulations, experimentation in the laboratory, and mathematical modeling.

Research topics include primary and secondary productivity and nutrient regeneration, fishery biology and management, community ecology of benthic and pelagic organisms, population dynamics, habitat changes and disruptions, systematics and biogeography, population genetics and evolution, and behavior as it affects distribution. Development and testing of new tools (molecular, optical, acoustic), design of sampling programs, and statistical/mathematical analyses of data also are significant activities.

Climate Sciences concerns the study of the climate system of the earth with emphasis on the physical, dynamical, and chemical interactions of the atmosphere, ocean, land, ice, and the terrestrial and marine biospheres. The program encompasses changes on seasonal to interannual time scales and those induced by human activities, as well as paleoclimatic changes on time scales from centuries to millions of years. Examples of current research activities include: interannual climate variability; physics and dynamics of El Niño; studies of present and future changes in the chemical composition of the atmosphere in relation to global warming and ozone depletion; effects of cloud and cloud feedbacks in the climate system; paleoclimate reconstructions from ice cores, banded corals, tree-rings, and deep-sea sediments; the origin of ice ages; air-sea interactions; climate theory; terrestrial and marine ecosystem response to global change.

Geosciences emphasizes the application of general principles of geology, geochemistry, and geophysics to problems in the marine and terrestrial environments of the Earth. Graduate students routinely participate in expeditions at sea and on land and many doctoral theses evolve from these experiences.

Research areas in the geological sciences include: the origin and evolution of the ocean-atmosphere system and global climate; geology, geochemistry, and geophysics of oceanic crustal rocks and near-shore environments; tectonic and structural evolution of the oceans, plate margins, and back-arc basins; the role of fluids in the crust; chemistry of rare gases in active volcanoes; the use of natural nuclear processes for understanding physical and chemical processes in the Earth; paleomagnetic applications in geology and geophysics.

Geophysics emphasizes the application of general principles of mathematics and experimental physics to fundamental problems of the oceans, oceanic and continental lithosphere, and crust and deep interior of the Earth. Research interests of the group include: observational and theoretical studies of electric and magnetic fields in the oceans and on the land; paleomagnetism; theoretical seismology with special emphasis on the structure of the Earth from free-oscillation and body wave studies; broadband observational seismology, including ocean bottom and multichannel seismology; earthquake source mechanisms; the measurements of slow crustal deformations using satellite and observatory methods on continents and in the oceans; marine geodynamics and tectonophysics; gravity measurements; geophysical inverse theory; magnetohydrodynamics of the core of the Earth; geophysical instrumentation for oceanic and continental geophysical measurements; acoustic propagation in the oceans.

Marine Biology is the study of marine organisms. It is concerned with evolutionary, organismic, genetic, physiological, and biochemical processes in these organisms, and the relationship between them and their biotic and physical environment. Marine biology encompasses several major areas of modern biology, and is interpreted by understanding the physical and chemical dynamics of the oceans. Faculty research focuses on microbiology, photobiology, high pressure biology, deep-sea biology, developmental biology, genetics, biomechanisms, comparative biochemistry and physiology, behavior, ecology, biogeography, and evolution of marine prokaryotes and eukaryotes. Processes ranging from the fertilization of sea urchin eggs to the role of bacteria in marine food web dynamics are under study in over twenty independent research laboratories.

Marine Chemistry and Geochemistry concerns chemical and geochemical processes operating in a broad range of study areas: the oceans, the solid earth, the atmosphere, marine organisms, polar ice sheets, lakes, meteorites, and the solar system.

Areas of advanced study and research include the physical and inorganic chemistry of seawater; ocean circulation and mixing based on chemical and isotopic tracers; marine organic and natural products chemistry; marine bioinorganic chemistry; geochemical interactions of sediments with seawater and interstitial waters; geochemistries of volcanic and geothermal phenomena; chemical exchanges between the ocean and the atmosphere; geochemical cycles of carbon, oxygen, sulfur, nitrogen, and other elements; isotopic geochemistry of the solid earth and meteorites; atmospheric trace gas chemistry; paleoatmospheric composition recorded in polar ice cores, corals and sediments; and chemistry of lakes and other freshwater systems.

Studies are typically interdisciplinary and involve integration of chemical concepts with information about the physical, biological, or geological processes that influence natural systems. Students in the marine chemistry and geochemistry curricular group are encouraged to explore these links.

Physical Oceanography is the field of study that deals with mechanisms of energy transfer through the sea and across its boundaries, and with the physical interactions of the sea with its surroundings, especially including the influence of the seas on the climate of the atmosphere. Research activities within this curricular group are both observational and theoretical and include: study of the general circulation of the oceans, including the relations of ocean currents to driving forces and constraints of the ocean basins; fluctuations of currents, and the transport of properties; the mechanisms of transport of energy, momentum, and physical substances within the sea and across its boundaries; properties of wind waves, internal waves, tsunami and planetary waves; the thermodynamic description of the sea as a system not in equilibrium; optical and acoustic properties of the sea; and the influence of surf on near-shore currents and the transport of sediments.

Requirements for Admission

Candidates for admission should have a bachelor's or master's degree in one of the physical, biological, or earth sciences; degrees in mathematics or engineering science are also accepted. A scholastic average of B or better in upper-division courses, or prior graduate study, is required. The student's preparation should include:

(1) mathematics through differential and integral calculus

(2) physics, one year with laboratory (the course should stress the fundamentals of mechanics, electricity, magnetism, optics, and thermodynamics, and should use calculus in its exposition)

(3) chemistry, one year with laboratory

(4) an additional year of physics, chemistry, or mathematics

(5) all applicants are required to submit scores from the general test of the Graduate Record Examinations (GRE) given by the Educational Testing Service of Princeton, New Jersey. Marine biology applicants must also submit scores of the GRE biology (or biochemistry, cell, and molecular biology) subject test.

All international applicants whose native language is not English and whose undergraduate education was conducted in a language other than English must take the TOEFL and submit their test scores to the UCSD Office of Graduate Admissions.

Specific additional requirements for admission to the various curricular programs are as follows:

Applied Ocean Science—Students are admissible with a strong background in physical science, engineering science, or mathematics. Three years of physics or applicable engineering and three years of mathematics at college level are expected.

Biological Oceanography—Two years of chemistry, including general and organic chemistry, and a year of general biology are required. Physical chemistry requiring calculus may be substituted for physics requiring calculus where a more elementary physics course was taken. Zoology or botany may be substituted for general biology. Preparation should also include a course in general geology and at least one course in each of the following categories: systematics (e.g., invertebrate zoology), population biology (e.g., ecology), functional biology (e.g., physiology). In special cases, other advanced courses in mathematics or natural sciences may be substituted. Biological oceanography applicants are encouraged, but not required, to submit scores of the biology subject test of the GRE.

Climate Sciences—Students are admissible if they satisfy the requirements of the physical oceanography, geophysics, or marine chemistry and geochemistry curricular programs. Biology and geology majors may also be admissible if the Scripps faculty feel that they have a sufficiently strong background in mathematics and physical science.

Geosciences—A major in one of the earth sciences and undergraduate physical chemistry and calculus are required. Preparation beyond the minimum requirements in mathematics, physics, and chemistry is strongly recommended.

Geophysics—A major in physics or mathematics, or equivalent training, is required.

Marine Biology—A major in one of the biological sciences (or equivalent), with basic course work in botany, microbiology, or zoology; two years of chemistry, including organic chemistry, is required. Training in one or more of the following areas is strongly recommended: cellular biology, molecular biology, comparative physiology, genetics, developmental biology, ecology, evolutionary biology, vertebrate and invertebrate zoology, microbiology, and/or botany. Biochemistry and physical chemistry will be expected of students in experimental biology, although the student may, if necessary, enroll in these courses at UCSD after admission.

Marine Chemistry and Geochemistry—A major in chemistry, geology, biochemistry, or related field, is required.

Physical Oceanography—A major in a physical science, including three years of physics and mathematics, is required.

Special consideration occasionally can be given to candidates with outstanding records who do not meet all required preadmission criteria.

Programs of Study

Programs of study vary widely among the curricular groups, but generally first-year students are expected to enroll in core courses that cover physical, geological, chemical, and biological oceanography and in other courses recommended by the student's faculty adviser. Then, by the end of the first year, students usually select a particular area of focus and choose a major professor. As students advance beyond the first year, they begin to function effectively as research assistants or, in some cases, as teaching assistants. During their third to fifth year they are working toward writing their dissertations.

The interdisciplinary nature of research in marine and earth sciences is emphasized; students are encouraged to take courses in several programs and departments, and to select research problems of interdisciplinary character. The curricular programs of study are as follows:

Applied Ocean Science—The AOS academic program is designed to provide both a broad background and a core technical base to support the diverse interests and activities of the students. Early participation in an ongoing research project is encouraged. However, specialization and focus on a specific thesis topic is not required until the second or third year of the program. Required courses include SIO 214A Introduction to Fluid Mechanics, SIO 221A Analysis of Physical Oceanographic Data, and the two-quarter Wave Physics sequence SIO 202A–B. Two of the four SIO introductory courses (SIO 210, 240, 260, 280), must be completed during the first year, with the remaining two required prior to passing the doctoral qualifying exam at the end of the third year. In addition, the applied math sequence SIO 203 A–B or MAE 294 A–B is taken in either the first or second year of study. The AOS Seminar (SIO 208) serves as a communications bridge across the program; enrollment in this seminar is required during the student's entire period of study. Beyond these core classes, the majority of each student's academic program is tailored to individual interests. The AOS departmental examination, held at the end of the first year, is based on the core technical courses SIO 214A, SIO 221A, SIO 202A–B, and two of the four introductory courses

(chosen by the student). The exam has both oral and written components.

Biological Oceanography—The student will be expected to be familiar with the material presented in the following courses: SIO 210, 240, 260, 270 or 270A, 275A or 277, 280, 290, and at least one of SIO 271, 274, 282, 284, or 294. Other course work ordinarily will be recommended by the student's advisory committee, usually including 278 (or equivalent participatory seminar) one quarter of each year, a course in introductory parametric statistics, and at least one advanced-level course in physical, chemical, or geological oceanography. Participation in an oceanographic cruise (minimum of two weeks' duration) and service as a teaching assistant (one quarter) are required. Individual advisers and/or doctoral committees may require foreign languages or computer programming languages of individual candidates.

Climate Sciences—The emphasis of this curricular group is on education through interdisciplinary research. All students are responsible for the fundamental material in the following "core" courses: SIO 210, 217A-B-C, 260. Students are also expected to supplement their backgrounds with five to seven additional courses, including, for most Climate Sciences students, at least one additional quarter of fluid dynamics. These additional course(s) will be chosen in consultation with the students' advisors. It is recommended that students participate actively in at least two quarters of seminar courses designed to complement and stimulate individual research. Though the group stresses interactions across disciplines, students will specialize in a particular subdiscipline or track that will be chosen by the student following discussions with a 3-person faculty advisory committee soon after arrival. Examples of current tracks include: (1) atmospheric/ocean/climate dynamics and physics; (2) atmospheric chemistry (emphasizing climatic interactions); and (3) paleoclimate studies. Additional course requirements for these tracks will be tailored to the needs of the individual student.

Geosciences—The geosciences curriculum consists of a series of core courses and a series of research focus courses. All students whether pursuing an earth sciences or an oceanography degree are responsible for material in the core courses: Marine Geology (SIO 240), Marine Chemistry (SIO 260), and Physical Oceanography (SIO 210) during their first year of study. The research courses are selected from three themes: Geochemistry, Paleoclimate and Earth History, and Geology and Geophysics. A total of four research courses are required during the first year of study, with at least one from each theme. Additional courses offered by other curricular programs (e.g., geophysics, marine chemistry, and geochemistry) can be selected and scheduled depending on the student's background and interests any time during the student's career at SIO. A three-member faculty advisory committee is assigned to each student to help select the research and additional courses to be taken. Each student is also encouraged to participate in the Special Topics seminars (SIO 249) every quarter during the first two years of graduate study. Students wishing to graduate with an oceanography degree are also responsible for the material in SIO 280 (Biological Oceanography). Normally, students will take a comprehensive oral departmental examination near the end of their third quarter of residence. The qualifying examination will be given before the end of the third year.

Geophysics—There is no single course of study appropriate to the geophysics curriculum; instead, the individual interests of the student will permit, in consultation with the adviser, a choice of course work in seismology, geomagnetism, etc., although the content of certain core courses is usually taken during most of the first year. In the summer or early fall quarter following that year each student will be given written and oral departmental examinations, which are intended to cover the student's formal training. A brief presentation of possible research interests will also be expected at this exam.

Geosciences/Geophysics Track—For those students whose interests fall between the programs provided by the geosciences and the geophysics curricular groups, these groups are jointly offering a separate program and departmental examination. Such students would be admitted either to the geosciences or geophysics curricular group, but could declare their interest in a geosciences/geophysics track early in their first year. If they did so, they would take a departmental exam (at the end of spring quarter of their first year) which would be conducted by a committee with members from both curricular groups, and focusing on the student's ability to integrate material relevant to the subject. The expected courses would include those geosciences/geophysics courses appropriate to this specialization.

Marine Biology—Entering graduate students will be expected to gain research experience in one or more laboratories during their first year. In the spring term of their first year at SIO, students will take a departmental exam consisting of a presentation of their first-year research in the form of a paper and short talk to the curricular group, followed by a meeting with their first-year advisory committee. In this exam they also will be expected to demonstrate competence in the material covered in the following courses: SIO 210, 260, 280, 290 as well as any other course work recommended by the advisory committee. After their first year all students are expected to enroll and actively participate in at least one seminar course (SIO 278, 296, or equivalent) per year to provide in-depth knowledge and reading in selected areas, and to provide practice presenting scientific material. In addition to the seminar requirement discussed above, second-year students will present their research in a special Marine Biology mini-symposium, held in spring quarter; students in the third year and beyond are expected to participate in the research presentation class (SIO 291) each year. The curricular group coordinator, in consultation with the Ph.D. advisory committee, may waive specific course requirements in individual cases.

Marine Chemistry and Geochemistry—Students in this curricular group are required to take SIO 210, 260, and either SIO 280 or a suitable geosciences course (e.g. SIO 240) in their first year at SIO. Students in this curriculum are also expected to take additional SIO and UCSD courses; the exact choice of such courses will depend on the student's research interests and should be made in consultation with a faculty adviser.

Physical Oceanography—The physical oceanography curriculum combines a comprehensive program of coursework with individually tailored specialization to meet student needs. Students will demonstrate proficiency in foundation courses required for all subdisciplines of physical oceanography (SIO 203A-B, 214A, 212A), as well as additional courses appropriate to their specialization or interdisciplinary interest. Presently defined "tracks" in the curriculum are (i) Observational Physical Oceanography, (ii) Theoretical Physical Oceanography, and (iii) the Atmospheric/Ocean Climate System. All tracks are similar in the entry-year Fall Quarter, diverging as students become more familiar with the field and in their interests. A faculty Curriculum Advisory Committee meets with students to tailor tracks to individual needs, or to create new tracks as appropriate. In any track, the total body of required knowledge is equivalent to 16 four-unit courses, of which about 12 are covered during the first year. As part of the overall requirement, tracks include a

breadth component of 2 or more four-unit courses in other oceanographic disciplines. These might come from the SIO core courses in other disciplines (SIO 240, 260, 280) or from related graduate level courses taught at UCSD.

Language Requirements

The department has no formal language requirements. Within the department, some curricular programs may require demonstration of ability to use certain foreign languages pertinent to a student's research. All students must be proficient in English.

Departmental and Qualifying Examinations

Doctoral candidates normally will be required to take a departmental examination not later than early in the second year of study. The examination will be oral and/or written depending on the curricular group. The student will be required to demonstrate, in a quantitative and analytical manner, comprehension of required subject material and of the pertinent interactions of physical, chemical, biological, or geological factors.

When the student has passed the departmental examination, and has completed an appropriate period of additional study, the department will recommend appointment of a doctoral committee which will supervise the student's performance and reporting of his or her research. The doctoral committee must be formed before the student may proceed to the qualifying examination.

The doctoral committee will determine the student's qualifications for independent research by means of a qualifying examination, which will be administered no later than the end of the third year. The nature of the qualifying examination varies between curricular groups. In biological oceanography, marine biology, geosciences, physical oceanography, applied ocean science, and climate sciences the student will be expected to describe his or her proposed thesis research and satisfy the committee, in an oral examination, as to mastery of this and related topics. In marine chemistry and geochemistry the student, in an oral examination, is required to present and defend a single research proposition in his or her specialized area. The student also is required to provide a written summary of the research proposition, with references, prior to the examination. In geophysics, the student presents an original research problem, in the form of a written proposition, to the doctoral committee. The student's oral presentation and defense of this proposition completes the examination.

Dissertation

A requirement for the Ph.D. degree is the submission of a dissertation and a final examination in which the thesis is publicly defended. We encourage students to publish appropriate parts of their theses in the scientific literature. Individual chapters may be published as research articles prior to completion of the dissertation.

Departmental Ph.D. Time Limit Policies

Students must complete a qualifying examination by the end of three years, and must be advanced to candidacy for the Ph.D. degree by the end of four years. Total university support may not exceed seven years and total registered time at UCSD may not exceed eight years.

Special Financial Assistance and Fellowships

In addition to teaching assistantships, and graduate student researcher positions, fellowships, traineeships, and other awards available on a campus-wide competitive basis, the department has available a certain number of fellowships and graduate student researcher positions supported from research grants and contracts, or from industrial contributions.

COURSES

LOWER-DIVISION

87. Freshman Seminar (1)
The Freshman Seminar Program is designed to provide new students with the opportunity to explore an intellectual topic with a faculty member in a small setting. Topics vary from quarter to quarter. Enrollment is limited to 15–20 students, with preference given to entering freshmen. (P/NP grades only.) SIO Staff (F,W,S)

UPPER-DIVISION

198. Directed Group Study (2-4)
Directed group study on a topic or in a field not included in the regular department curricula, by special arrangement with a faculty member. (P/NP grades only.) *Prerequisite: consent of instructor.* Staff (F,W,S)

199. Special Studies (2 or 4)
Independent reading or research on a problem by special arrangement with a faculty member. (P/NP grades only.) *Prerequisite: consent of instructor.*

GRADUATE

200A. Computational Ocean Acoustics and Signal Processing I (4)
Overview of ocean acoustics. Acoustics Wave Equation with some analytic solution techniques. Ray Methods. Introduction to Spectral and Normal Modes methods. Introduction to beamforming including matched field processing. Computer programs will be constructed on all subjects covered. *Prerequisites: basic physics and familiarity with differential equations and some linear algebra.* Kuperman (F)

200B. Computational Ocean Acoustics and Signal Processing II (4)
Continuation of SIO 200A. Range dependent propagation models including adiabatic and coupled mode models and parabolic equations. More advanced topics in matched field processing. *Prerequisite: SIO 200A.* Kuperman (W)

200C. Computational Ocean Acoustics and Signal Processing III (4)
Continuation of SIO 200B. Modeling interference such as ambient noise. Time domain methods. Matched field tomography, nonlinear optimization methods, and geophysical inversion. *Prerequisite: SIO 200B.* Kuperman (S)

201. Geological Record of Climate Change (4)
Introduction to geological archives; the tools for paleoclimate reconstruction and a sampling of important issues from the geological record, including the development of "greenhouse" and "icehouse" worlds, the origin and evolution of glacial cycles, and the origin of "millennial scale" climate variability. *Prerequisite: chemistry and physics required for graduate admission to SIO, ERTH 101 or equivalent, or consent of instructor.* Charles (W)

202 A-B. Fundamentals of Wave Physics (4-4)
This two-quarter sequence is designed to introduce a broad background of students to basic principles of wave physics, including generation, propagation, dispersion, refraction, diffraction, reflection, waveguides, etc. A variety of wave motions of environmental relevance, including acoustic, ocean surface and internal (SIO 202A), optical and seismic (SIO 202B) are used to illustrate these principles. In-class experiments, data collection, and analysis exercises are incorporated. *Prerequisites: calculus and partial differential equations.* Buckingham, Kuperman, Stramski, Melville, Hildebrand, Dorman (W)

203A-B-C. Methods of Applied Analysis (4-4-4)
Methods of analysis with emphasis on physical applications, including: complex analysis, Fourier methods, Sturm-Liousville theory, boundary value problems and Green's function techniques, Frobenius' method, special functions, steepest descents, multiple scales, WKB methods, asymptotic expansions, variational methods, Wiener-Hopf techniques, Galerkin methods. *Prerequisites: Math. 110 and 120A, or consent of instructors.* Cessi, Ierley, Young (F,W,S)

204A. Advanced Acoustics I (4)
Boundary value problems in vibrating systems, wave propagation in strings, bars, and plates. Fundamentals of acoustical transducers. *Prerequisite: concurrent registration in ECE 145AL recommended.* Hildebrand (F)

204B. Advanced Acoustics II (4)
Theory of radiation, transmission and scattering of sound with special application to ocean acoustics. *Prerequisites: concurrent registration in ECE 145BL recommended; SIO 204A or consent of instructor.* Buckingham (W)

205. Applied Nonparametric Statistics (4)
Methods of nonparametric statistical analysis. sampling, and experimental design with emphasis on those procedures particularly useful in field studies. Designed to supplement an introductory parametric statistics course. Offered in alternate years. *Prere-quisites: elementary statistics or consent of instructor.* Venrick (S)

207A. Digital Signal Processing I (4)
Sampling: A/D and D/A conversion, discrete linear system theory, z-transforms; digital filters, recursive and nonrecursive designs, quantization effects; fast Fourier transforms, windowing, high speed correlation and convoluting; discrete random signals; finite word length effects. *Prerequisite: ECE 109, 153, or consent of instructor.* (S/U grades permitted.) Hodgkiss (F)

207B. Digital Signal Processing II (4)
Power spectrum estimation; homomorphic signal processing; applications to: speech, radar/sonar, picture, biomedical, and geophysical data processing. *Prerequisite: SIO 207A or consent of instructor.* (S/U grades permitted.) Hodgkiss (W)

207C. Digital Signal Processing III (4)
Single and multichannel data processing in a time varying environment; adaptive filters; high resolution spectral estimation; linear prediction; adaptive beamforming. *Prerequisite: SIO 207A-B or consent of instructor.* (S/U grades permitted.) Hodgkiss (S)

207D. Array Processing (4)
The coherent processing of data collected from sensors distributed in space for signal enhancement and noise rejection or wavefield directionality estimation. Conventional and adaptive beamforming. Sparse array design techniques. Applications to ocean acoustics and marine geophysics. *Prerequisite: SIO 207A or equivalent.* (S/U grades permitted.) Hodgkiss, Dorman (F)

208. Seminar in Applied Ocean Sciences (1)
Topics in applied ocean sciences. One hour seminar. (S/U grades only). Staff (F,W,S)

209. Special Topics (1-4)
Within the next few years, lectures on various special subjects will be offered by members of the staff. The emphasis will be on topics that reveal the interdependence of the biological, chemical, geological, and physical processes operating in the oceans. (S/U grades permitted.) Staff (F,W,S)

210. Physical Oceanography (4)
Physical description of the sea; physical properties of seawater, methods and measurements, boundary processes, regional oceanography. *Prerequisites: the mathematics and physics required for admission to the graduate curriculum in the Scripps Institution of Oceanography (see text), or consent of instructor.* Hendershott, Talley (F)

211A-B. Ocean Waves (4-4)
Propagation and dynamics of waves in the ocean including the effects of stratification, rotation, topography, wind, and nonlinearity. *Prerequisites: for SIO 211B, SIO 211A and SIO 214A, or consent of instructor.* Guza, Hendershott, Melville, Salmon, (W,S)

212A-B. Geophysical Fluid Dynamics (4-4)
The equations of motion for rotating stratified flow and their application to the atmospheric and oceanic dynamics; Ekman layer dynamics, potential vorticity dynamics, the quasigeostrophic approximation, theories of the wind-driven oceanic circulation, theories of the atmospheric Hadley circulation, geostrophic adjustment, and baroclinic instability. *Prerequisite: SIO 214A or consent of instructor.* Cessi, Young (W,S)

213. Ocean Turbulence and Mixing (4)
Mixing mechanisms, their identification, description, and modeling. Introduction to turbulence, semi-empirical theories, importance of coherent structures, effects of stratification and rotation on turbulent structure, entrainment and mixing. Cross-listed with MAE 214B. (S/U grades permitted.) Armi (S)

214A. Introduction to Fluid Mechanics (4)
A survey of classical problems in fluid mechanics and approximate techniques of analysis. Topics include conservation equations, straight laminar flows, low and high Reynolds number laminar flow, stability of laminar flows, turbulent flow. *Prerequisite: partial differential equations.* Winant (F)

214B. Environmental Fluid Dynamics (4)
Single-layer flows with a free surface, two-layer flows including exchange flows in harbors, estuaries, seas, and buildings. Continuously stratified flows with meteorological and oceanographic applications. Topographic effects, plumes, jets, and thermals. Cross-listed with MAE 224. *Prerequisite: introductory graduate level course in fluid mechanics.* (S/U grades permitted.) Armi (F)

215. Introduction to Atmospheric Radiative Transfer (4)
Introduces elementary concepts in electromagnetism and quantum mechanics to explain scattering, absorption and emission by gases, aerosols, and clouds. Elegant analytical solutions to the transfer equation will be employed in conjunction with satellite and laboratory measurements to consider phenomena such as the CO_2 greenhouse effect, albedo effect of clouds, color of the skies, and atmospheric radiative cooling. *Prerequisites: undergraduate courses in physics and differential calculus.* Ramanathan (S)

216. Introduction to the Physics of Complex Systems (4)
Emergent complex behavior in nonlinear, dissipative, open dynamical systems will be investigated by studying fundamental properties and their manifestation in examples drawn from the physical and biological sciences. Topics to include fractals, chaos, self-organization, artificial life, and neural networks. *Prerequisites: basic solid and fluid mechanics, mathematics through PDEs, and computer programming skills.* (S/U grades permitted.) Werner (W)

217A. Atmospheric and Climate Sciences I (4)
Thermodynamics and statics of dry and moist air, atmospheric composition, Earth radiation budget, vertical structure of the atmosphere, global energy balance, thermodynamic feedbacks in the climate system. *Prerequisites: undergraduate general physics and mathematics through differential equations.* (S/U grades permitted.) Somerville (F)

217B. Atmospheric and Climate Sciences II (4)
Structure of midlatitude synoptic systems; equations of motion, scale analysis, elementary applications and wave solutions; baroclinic instability theory; atmospheric general circulation and energetics; tropical dynamics; relationships between atmospheric dynamics, CO_2 clouds, precipitation, and other weather and climate phenomena. *Prerequisite: SIO 217A.* J. Norris (W)

217C. Atmospheric and Climate Sciences III (4)
Physical and dynamical processes that determine climate and climate change; role of aerosols; water vapor; CO_2 and other greenhouse gases; cloud-radiative interactions; atmospheric general circulation; role of convection; tropical climate including El Niño. *Prerequisites: SIO 217A and 217B or equivalent background.* Ramanathan (S)

218. Land Surface Hydrology (4)
Advanced introduction to natural processes that govern water occurrence and transport over the land surface. Principles of global hydrologic cycle and land-surface water balance, runoff and fluvial geomorphology, infiltration and subsurface water flow, evaporation and plant transpiration. *Prerequisite: graduate standing.* Georgakakos (S)

219. Special Topics in Physical Oceanography (1-4)
Example topics are case histories and methods in physical oceanography, theories of the ocean circulation, numerical methods in large-scale ocean and atmospheric models, and natural electromagnetic phenomena in the earth and the oceans. (S/U grades permitted.) Staff (F,W,S)

220. Observations of Large-Scale Ocean Circulation (4)
General circulation of the oceans; tropical, subtropical, and high-latitude current systems of the Atlantic, Indian, and Pacific Oceans and marginal seas; ocean heat flux and thermohaline circulations; observational basis of large-scale dynamics. *Prerequisite: SIO 210.* (S/U grades permitted.) Roemmich (S)

221A. Analysis of Physical Oceanographic Data (A) (4)
Fundamental elements of analysis of geophysical and oceanographic time series, including sampling problems, least squares techniques, spectral analysis, interpretation of series, design of experiments. *Prerequisite: consent of instructor.* Guza, Pinkel (F)

221B. Analysis of Physical Oceanographic Data (B) (4)
Techniques for analysis of physical oceanographic data involving many simultaneous processes including probability densities, sampling errors, spectral analysis, empirical orthogonal functions, correlation, linear estimation, objective mapping. *Prerequisite: SIO 221A or consent of instructor.* (S/U grades permitted.) Davis, Rudnick (W)

221C. Data Analysis Laboratory (4)
This course is to give students practical experience with analysis techniques. Students complete three projects. Topics include empirical orthogonal functions, objective mapping, complex demodulation, inference of geostrophic flow, minimization of CTD salinity spiking, isolation of wind-driven currents, wavelets. *Prerequisite: SIO 221A-B or equivalent. (S/U grades only.)* Rudnick, Gille (F)

222. Underwater Bioacoustics (4)
Introductory course to familiarize a broad spectrum of participants to underwater sound and its relationship to underwater animals. Basic physics of sound propagation. use of sound to study underwater animals and, the sounds made by the animals themselves for echolocation and communication will be covered. *Prerequisite: consent of instructor,* (S/U grades permitted Jaffe (W)

223. Geophysical Data Analysis (4)
Design of geophysical experiments and analysis of geophysical measurements, interpretation of geophysical time series; sampling, least squares, spectrum analysis. Staff (W)

224. Internal Constitution of the Earth (4)
An examination of current knowledge about the composition and state of the earth's interior revealed by geophysical observations. Seismic velocity and mass density distributions; equations of state; phase changes; energy balance and temperatures; constraints on composition from extraterrestrial samples and exposed rocks; spherical and aspherical variations of properties. *Prerequisites: calculus and differential equations, basic chemistry and physics, or consent of instructor.* Staff (S)

225. Physics of Earth Materials (4)
Mathematics and physics of continuous media, focusing on geophysical problems. Topics include deformation, stress, conservation laws, elasticity, attenuation, viscoelasticity, fracture mechanics, and porous media. *Prerequisite: consent of instructor.* Staff (F)

226. Introduction to Marine Geophysics (4)
Methods of exploration geophysics with emphasis on those useful at sea. Magnetic and gravitational potential field methods, multi-beam echo sounding reflection and refraction seismology will be covered. Recent papers from the literature will also be read and discussed. *Prerequisites: differential equations; at least one geology course.* (S/U grades permitted.) Dorman, Hildebrand (W)

227A. Introduction to Seismology (4)
Introduction to seismometers and seismograms; stress and strain; potentials and the wave equation; geometrical ray theory and travel times in layered media; representation of seismic sources; WKBJ and synthetic seismograms; seismic hazards and other applications of seismology. *Prerequisite: consent of instructor.* (S/U grades permitted.) Staff (F)

227B. Advanced Seismology I (4)
Introduction to low-frequency digital data; continuum mechanics and the equations of motion; free oscillation solutions; construction of Earth models; excitation of free-oscillations and source mechanism retrieval; array processing of long-period data; modelling aspherical structure; surface waves. *Prerequisite: consent of instructor.* (S/U grades permitted.) Staff (W)

227C. Advanced Seismology II (4)
High-frequency wave propagation; methods for computing synthetic seismograms including WKBJ, reflectivity and finite differences; body-wave spectra; attenuation of body waves; source physics; reflection and refraction seismology; seismic tomography. *Prerequisite: consent of instructor.* (S/U grades permitted.) Staff (S)

229. Gravity and Geomagnetism (4)
Introduction to potential theory, with applications to gravity and geomagnetism. Topics include the geoid, spherical harmonics, Laplace's equation, the Dirichlet problem on a sphere, and Fourier methods. Gravity anomalies and geomagnetic field modeling and sources are discussed; also paleomagnetic observations. *Prerequisites: advanced calculus, differential equations, complex variables, and familiarity with Maxwell's equations, or consent of instructor.* (S/U grades permitted.) C. Constable, Parker (F)

230. Introduction to Inverse Theory (4)
Solution of linear and nonlinear inverse problems in geophysics by optimization techniques such as norm minimization and linear programming. Construction of models by regularization; inference by bounding functionals. Illustrations from gravity, geomagnetism, and seismology. *Prerequisite: consent of instructor.* (S/U grades permitted.) Parker (W)

232. Environmental Geophysics (4)
A field-based course on the geophysical techniques employed in modern environmental surveys for ground water studies, contaminant and hazard assessment, soil and foundation evaluation, and archaeology. Includes shallow seismic, electrical, and ground penetrating radar methods. Seminars describing equipment and procedures will be followed by field trips, and the resulting data reduced and interpreted under supervision. *Prerequisite: consent of instructor.* S. Constable, Harding (S)

233. Introduction to Computing at SIO (4)
Introduction to the SIO computing environment and common software tools in geophysics and other disciplines. Topics include UNIX, Matlab, Postscript, GMT, LaTex, HTML, and a scientific programming language such as C or Fortran90. *Prerequisite: consent of instructor.* (S/U grades permitted.) Shearer (F)

234. Geodynamics (4)
A general course on the dynamics and kinematics of the solid earth based on the text of Turcotte and Schubert. Topics include plate tectonics, heat flow, lithospheric cooling, flexure, viscous flow, global gravity, crustal structure, and other related topics. *Prerequisite: familiarity with partial differential equations and Fourier transforms.* (S/U grades permitted.) Sandwell (W)

236. Satellite Remote Sensing (4)
A general course on physical principles of remote sensing based on the text by Rees. Topics include: orbit geometries and platforms; propagation, reflection, and emission of electromagnetic waves; electro-optical systems; passive microwave systems, ranging systems; and scattering techniques such as SAR. *Prerequisite: consent of instructor.* (S/U grades permitted.) Sandwell (F)

237A. Introduction to Ocean Optics (4)
Overview of ocean optics. Concepts in radiometry. Inherent and apparent optical properties. Radiative transfer equation. Light absorption and scattering by seawater constituents. Optics of air-water interface. Light fields within and leaving the ocean. Optics of marine particles. Measurement methods and instrumentation. *Prerequisites: basic physics and differential calculus, or consent of instructor.* Stramski (F)

237B. Ocean Color Remote Sensing (4)
Overview of ocean color satellite missions. Concepts in radiometry. Inherent and apparent optical properties. Radiative transfer equation. Solar radiation and elements of atmospheric optics. Propagation of light across the sea surface and within the ocean. Light absorption and scattering by seawater. Water-leaving radiance and remote-sensing reflectance. Ocean color algorithms and applications. *Prerequisites: basic physics and differential calculus, or consent of instructor.* (S/U grades permitted.) Stramski (F)

237C. Optical-Biological Interactions in the Ocean (4)
A discussion class with emphasis on the interaction of light with marine plankton. Topics will include light absorption, fluorescence, and scattering by phytoplankton and effects of growth conditions on phytoplankton optical properties. Classic and contemporary papers dealing with these topics will be discussed. *Prerequisites: basic physics and biology, or consent of instructor.* (S/U grades only.) Stramski (F)

238. Sensor Networks (4)
Characteristics of chemical, biological, seismic, and other physical sensors; signal processing techniques supporting distributed detection of salient events; wireless communication and networking protocols supporting formation of robust sensor fabrics; current experience with low power, low cost sensor deployments. Conjoined with MAE 149 and ECE 156. *Prerequisite: upper-division standing and approval of instructor, or graduate student in science or engineering.* (S/U grades permitted.) Hodgkiss, Rao (S)

239. Special Topics in Geophysics (1-4)
Special course offerings by staff and visiting scientists. Example topics are seismic source theory, geophysical prospecting methods, dislocation theory and seismic mechanisms, tectonic interpretation of geodetic data, and dynamo theory. (S/U grades permitted.) Staff (F,W,S)

240. Marine Geology (4)
Introduction to the geomorphology, sedimentation, stratigraphy, vulcanism, structural geology, tectonics, and geological history of the oceans. *Prerequisites: the physics and chemistry required for admission to the graduate curriculum in SIO, and ES 101 or equivalent, or consent of instructor.* Staff (W)

241. Seminar in Hydrogeology and Tectonics (2)
Introduction to the role that fluids play in the physical development of active tectonic systems. Discussions will focus on the nature of the processes controlling fluid flow through the Earth's crust and the dynamic interaction of fluid migration and faulting. *Prerequisite: ES 101 or equivalent.* (S/U grades permitted.) Brown (S)

243. Marine Paleoecology (4)
Paleoecology of marine plankton, nekton, and benthos. Patterns and changes in marine communities and ecosystems over geological time in relation to changes in the physical, chemical, and geological environment and biotic interactions. The preservation filter and inference of ecological processes from fossils and biogeochemical proxies. Biotic interchanges, incumbency, escalation and trends, mass extinctions, and recovery. Lectures, seminar discussion, laboratory, and field trips. *Prerequisites: bachelor's degree in science or consent of instructor; open to undergraduates with completion of ERTH 104 and either BIEB 130 or BIEB 140, or equivalent.* Jackson, Staff (W)

244. Shape and Structure of the Ocean Floor (4)
Description and explanation of the structural geomorphology of oceanic crust, and of the tectonic and volcanic processes responsible for it. Description and interpretation of deep-sea sedimentary landforms (e.g., deep-sea fans, drifts, bedforms) and of the bottom currents that shape them. Offered in alternate years. *Prerequisite: any previous graduate/undergraduate earth science or geology course.* Lonsdale (S)

245. Seminar in Marine Sediment Geochemistry (2)
Chemical paleoceanography will be the focus, emphasis, on seawater and/or sediment chemical and isotopic records; discussions will concentrate on some of the following istopic systems: Li, B, C, O, S, Sr, and Nd, and on select chemical tracers such as Cd and Ir; on the marine phases that most reliably record seawater chemical and isotope compositions; and on diagenetic problems, how to identify and deal with them. *Prerequisite: SIO 260 and consent of instructor.* (Offered in alternate years.) (S/U grades permitted.) Kastner (S)

246. Global Tectonics and Basin Formation (4)
Plate tectonics of the crust and upper mantle, examining a variety of environments from ridge crests to continental margins, including plate interiors, with an emphasis on basin formation in these tectonic settings. *Prerequisite: graduate standing.* Cande, Driscoll (F)

247. Rock Magnetism and Paleomagnetism (4)
Rock magnetism and acquisition of magnetic remanence in geological materials as well as laboratory procedures and data analysis (isolating remanence components and statistical approaches). The paleomagnetic literature will be used to illustrate applications in geological and geophysical problems.

Prerequisites: one year each of college-level physics and geology; mathematics through calculus. (S/U grades permitted.) Tauxe (W)

249. Special Topics in Marine Geology (1-4)
Special course offerings by staff and visiting scientists. (S/U grades only.) Staff (F,W,S)

250. Earth History (4)
Geologic history of the Earth including evolution of the oceans, atmosphere, and life's diversity. Major developments and current controversies in Earth history and biological evolution covered in a combination of lecture, student-led discussion of key papers, and weekend field trips. *Prerequisite: ERTH 101 (or equivalent) or consent of instructor.* R. Norris (F)

252A. Introduction to Isotope Geochemistry (4)
Radioactive and stable isotope studies in geology and geochemistry, including geochronology, isotopes as tracers of magmatic processes, cosmic-ray produced isotopes as tracers in the crust and weathering cycle, isotopic evolution of the crust and mantle. Conjoined with ERTH 144. *Prerequisite: graduate: SIO entrance requirements or consent of instructor; undergraduate: ERTH 101, 102, 120, or equivalent.* Castillo, Hilton, R. Keeling, Lal (F)

252B. Advanced Isotope Geochemistry I (4)
An advanced treatment of noble gas and stable isotope geochemistry. Offered in alternate years with SIO 252C. *Prerequisites: SIO 252A/ERTH 144.* Bada, Hilton, Wahlen (S)

252C. Advanced Isotope Geochemistry II (4)
An advanced treatment of radiogenic and cosmogenic isotope geochemistry. Offered in alternate years with SIO 252B. *Prerequisites: SIO 252A/ERTH 144.* Lal, Macdougall (S)

256A. Introduction to Field Geology (4)
Mapping and interpretation of geologic units and structures in the field. Field observations at the surface are related to theory and extrapolated to three dimensions. Field work is done on weekends in local areas; field data are discussed and evaluated through applicable geologic principles in the laboratory. Conjoined with ERTH 162A. *Prerequisites: consent of instructor; to be taken concurrently with SIO 256L.* Brown, Castillo (W)

256L. Structural Analysis for Field Geology (4)
Principles of stratigraphy and structural geology applicable to field geologic studies. Discussion and laboratory exercises. Conjoined with ERTH 162L. *Prerequisites: consent of instructor; to be taken concurrently with SIO 256A.* Brown, Castillo (W)

257. Seminar in Petrology (4)
Discussion of current research in petrology and mineralogy. (S/U grades permitted.) Hawkins (W)

259. Atmospheric Geochemistry (4)
Topics in this introductory course include: structure and composition of the atmosphere; chemistry and isotopes of natural and man-made carbon-, nitrogen-, and sulfur-bearing trace gases; ozone and hydroxyl radical; halogenated gases; air-sea exchange; aerosols; climatic effects. (S/U grades permitted.) Wahlen, Weiss (W)

260. Marine Chemistry (4)
Chemical description of the sea; the distribution of chemical species in the world oceans, and their relationships to physical, biological, and geological processes. Aluwihare, Barbeau, R. Keeling (W)

261. Energetics and Kinetics in Marine Systems (4)
This course teaches the physical chemical principles that control chemistry in marine systems. After a basic introduction to thermodynamics and its application to an understanding of the marine environment, the emphasis will be on the study of a variety of kinetic processes. *Prerequisites: undergraduate chemistry equivalent to UCSD Chemistry 6 sequence, SIO 260.* Dickson (S)

262. Seminar in Marine Natural Products (1)
Students will give seminars on current research topics in marine natural products chemistry. *Prerequisite: consent of instructors.* (S/U grades only.) Fenical (F,W,S)

263. Aqueous Chemistry (4)
This course emphasizes the chemical principles that control basic aqueous chemistry in marine systems. The focus will be to show that the geochemistry of the various elements in sea water and biological systems can be understood as a consequence of basic general chemical concepts such as electron structure, chemical bonding, and group and periodic properties. *Prerequisite: undergraduate chemistry equivalent to UCSD Chemistry 6 sequence.* Dickson (F)

264. Special Topics in Marine Natural Products Chemistry (3)
This course provides the foundation for advanced study in the field of marine natural products chemistry. Topics vary from the history of natural products to the organic chemistry of terpenes, alkaloids, acetogenins, and other natural product classes. Varying by topic quarterly, this class is given each quarter and may be repeated. *Prerequisite: one year general organic chemistry.* (S/U grades only). Fenical (F,W,S)

265. Chemical Ecology of Marine Organisms (4)
An outline of the organic chemicals from marine organisms with special reference to their function in the marine environment. The differences between terrestrial and marine natural products will be stressed. *Prerequisite: basic organic chemistry.* Fenical (W)

267. Biogeochemistry (4)
Examines quantitatively the impact of the biota on the chemistry of the atmosphere and ocean. Emphasis given to isotopes as tracers of biogeochemical processes. Attention given to paleoclimatic and paleoatmospheric data from ice cores to reveal mechanisms. *Prerequisite: undergraduate inorganic chemistry and calculus and SIO 210 and SIO 260 or consent of instructor.* Severinghaus, R. Keeling (S)

268. Seminar in Geochemistry and Marine Chemistry (1)
Student seminars on topics related to geochemistry and the chemistry of the marine environment. (S/U grades only.) Dickson (W)

269. Special Topics in Marine Chemistry (1-4)
Special course offerings by staff and visiting scientists. (S/U grades permitted.) Staff (F,W,S)

270. Pelagic Ecology (4)
An analysis of the concepts and theories used to explain the biological events observed in the water column. Alternate years. *Prerequisites: SIO 210, 280, or consent of instructor.* Checkley, Ohman (S)

270A. Fisheries Oceanography (4)
Aspects of marine ecology relevant to the reproduction, survival, and distribution of commercially important marine species. Alternate years only. *Prerequisites: SIO 210 and 280, or consent of instructor.* (S/U grades only.) Checkley (S)

271. Marine Zooplankton (4)
Lectures and laboratories treating the morphological, behavioral, and life history variations of the principal phyla of planktonic invertebrates and heterotrophic protists. Constraints of life at low Reynolds numbers; principles of allometry; growth processes of heterotrophic organisms. *Prerequisite: SIO 280 or consent of instructor.* (S/U grades permitted.) Ohman (S)

272. Biogeography (3)
A lecture course concerning the origin, development, and perpetuation of distributional patterns with emphasis on benthic marine organisms. Newman (W)

273A. Professional Ethics in Science (2)
A seminar on the historical and contemporary ethics and ethos of scientific research, based on published documents. Given in alternate years. Dayton (S)

273B. Science and Marine Environmental Policy (2)
Lectures by the instructor, visiting lecturers, and class discussions focusing on how scientists can help policy makers transform scientific understanding into policy. Topics will emphasize conservation, fisheries management, and pollution issues. Given in alternate years. Dayton (S)

274. Marine Arthropods (5)
Lectures and laboratories on the natural history, morphology, taxonomy and phylogeny of arthropods with emphasis on marine forms. Alternate years. *Prerequisite: consent of instructor.* Hessler, Newman (W)

275A. Benthic Ecology (4)
Evolution and maintenance of benthic communities from the terrestrial margins to the deep sea. Special emphasis will be placed on physical and biological scaling and processes determining patterns of distribution and abundance; interrelationships between community structure and population phenomena, including trophic relationships, reproductive and recruitment patterns, succession, and life history biology. Offered in alternate years with SIO 275B. *Prerequisite: consent of instructor; open to undergraduates.* (S/U grades permitted.) Levin, Dayton, Sala (S)

275B. Natural History of Coastal Habitats (4)
Two three-hour laboratories per week, three four-six day field trips to sites from Mexico to Monterey Bay. Several one-day field trips to local habitats including lagoons, sand and rock intertidal habitats, areas of marine fossils, and areas with migrating birds. Format of course variable depending on student interests. Alternate years with 275A. *Prerequisites: open to undergraduates with consent of instructor and completion of BIEB 130, Introductory Marine Ecology.* (S/U grades permitted.) Dayton (W)

276. Quantitative Theory of Populations and Communities (4)
An introduction to the quantitative tools and conceptual issues underlying the study of the dynamics and structure of ecological systems. *Prerequisite: calculus (three quarters) or consent of instructor.* (S/U grades permitted.) Sugihara, Deriso (F)

277. Deep-Sea Biology (4)
The ecology, zoogeography, taxonomy, and evolution of deep-sea organisms, with emphasis on the benthos. Offered alternate years. *Prerequisite: consent of instructor.* (S/U grades only.) Levin, K. Smith (W)

278. Seminar in Ocean Biosciences (2)
Presentations of reports, review of literature, and discussion of current research in the marine biological and oceanographic sciences. (S/U grades permitted.) Staff (F,W,S)

279. Special Topics in Biological Oceanography (1-4)
(S/U grades permitted.) Staff (F,W,S)

280. Biological Oceanography (4)
The biology and ecology of marine plankton, nekton, and benthos. Emphasis will be on processes regulating species, community, and ecosystem patterns and changes, including productivity, trophic relationships and species interactions with the physical, chemical, and geological environment. One or more field trips. *Prerequisite: bachelor's degree in science or consent of instructor.* Franks or Checkley, Levin (F)

281. Environmental Physiology and Biochemistry of Marine Organisms (4)
Biochemical mechanisms of adaptation of organisms to the marine environment. Special emphasis is on the effects of pressure, temperature, salinity, oxygen, and light on the physiology and biochemistry. Conjoined with BIBC 130. *Prerequisites: adequate training in biochemistry and biology and consent of instructor.* Felbeck (W)

282. Phytoplankton Diversity (4)
Molecular, biochemical, ecological, and evolutionary perspectives on the diversity of eukaryotic and prokaryotic phytoplankton. *Prerequisite: consent of instructor.* Palenik (W)

283. Marine Biodiversity (4)
The origins, maintenance, collapse and restoration of diversity in the sea, discussed from both ecological and evolutionary perspectives. *Prerequisite: consent of instructor.* (S/U grades permitted). Knowlton (S)

284. Invertebrate Zoology (5)
Invertebrate zoology covering all of the major and minor phyla: phylogeny, anatomy, physiology and natural history. Lecture and laboratory demonstrations. *Prerequisite: consent of instructors; no audits. Holland, Hessler* (W)

285. Physical-Biological Interactions (4)
Physical and biological processes affecting growth and patchiness of plankton. Concepts and equations from physical oceanography will be presented and explored in a biological context. Ideas will be treated both theoretically and with examples from the literature. *Prerequisites: introductory calculus and SIO 210, or consent of instructor.* Franks (S)

287A. Marine Microbial Ecology (4)
Recent developments in the study of marine bacteria. Emphasis will be on biochemical and physiological adaptations of marine bacteria to the ocean environment. Bacterial metabolism, growth, and death will also be discussed in the context of trophic interactions and flows of material and energy in marine ecosystems. Molecular biology techniques used in the study of bacterial ecology will also be discussed. *Prerequisite: consent of instructor.* (S/U grades permitted.) Azam (F)

287B. Microbial Physiology (4)
Prokaryotic microbial physiology will be discussed primarily from a biochemical standpoint with emphasis on mechanism. Topics will vary from year to year but will include the following themes: Central Metabolism. Bioenergetics, Biosynthesis, Regulation, Differentiation. Prokaryotic Structure-Function Relationships, *Prerequisites: BiBC100 or BIBC 102 or equivalent.* Haygood, Saier (S).

288. Environmental Microbiology Laboratory (4)
This course emphasizes advanced techniques and theory in environmental microbiology. Students will perform experiments concerning (a) enrichment of diverse microbes (b) microbial enumeration and identification (c) metabolic and physiochemical adaptations, and (d) biotechnology, along with an independent project. *Prerequisite: consent of instructors,* Bartlett, Brahamsha, Haygood, Tebo (S)

289. Introduction to Quantitative Marine Ecology and Evolution (4)
An introduction to basic questions and problems in quantitative ecology with emphasis on marine organisms: spatial and temporal patterns, population dynamics and the behavior of higher order systems, multispecies populations and communities, and population genetics and life histories. *Prerequisites: some undergraduate mathematics and ecology will be assumed; or consent of instructor.* Burton, Jackson, Sala, Sugihara

290. Marine Biology (4)
An introduction to the field of marine biology, especially to the diversity of marine organisms at all taxonomic levels and their adaptations to the marine environment. *Prerequisite: graduate standing.* Palenik and Staff (W)

291. Biology Graduate Research Presentations (1)
Graduate students in the biological sciences present their research in a seminar or poster format. Class participants and instructors provide written feedback on the presentations. Required of third-year and beyond marine biology curricular group students during spring quarter. Open to all SIO graduate students. (S/U grades only.) Tebo, Haygood, Latz (S)

292. Scientific Communication (2)
Forms of scientific communication, practical exercise in scientific writing and short oral communication and in criticism and editing; preparation of illustrations, preparation of proposals; scientific societies and the history of scientific communication. Examples from any field of science, most commonly biology, marine biology, ecology, and neuroscience. *Prerequisite: graduate status in science.* (S/U grades only.) Yayanos, Staff (S)

294. Biology of Fishes (5)
The comparative evolution, morphology, physiology, and ecology of fishes. Special emphasis on local and deep-sea and pelagic forms in laboratory. *Prerequisite: graduate standing or consent of instructor.* Hastings (S)

295. Introduction to Marine Biodiversity and Conservation—Seminar (8)
Lectures on ecological, economic, social, and legal issues related to marine biodiversity and case studies on socioeconomic and legal issues. *Corequisite: SIO 295L for IGERT and MAS students only. Prerequisite: permission of instructor.*

295L. Introduction to Marine Biodiversity and Conservation—Lab (7)
Laboratory work on major biological taxa, field trips on biodiversity in situ, computer labs for informatic tools. *Corequisite: SIO 295 for IGERT and MAS students only. Prerequisite: permission of instructor.*

296. Special Topics in Marine Biology (1-5)
Example topics are reproduction in marine animals, adaptation to marine environments, larval biology, marine fisheries, macromolecular evolution, physical chemical topics in physiology, philosophy of science. (S/U grades permitted.) Staff (F,W,S)

297. Marine Biology Seminar (1)
Lectures given by visiting scientists and resident staff and students. (S/U grades only.) Staff (F,W,S)

298. Special Studies in Marine Sciences (1-4)
Reading and laboratory study of special topics under the direction of a faculty member. Exact subject matter to be arranged in individual cases. *Prerequisite: graduate standing.* (S/U grades permitted.) Staff (F,W,S)

299. Research (1-12)
(S/U grades permitted.) Staff (F,W,S)

Sociology

OFFICE: Social Sciences Building, Room 401
http://www.sociology.ucsd.edu

Professors

Harvey S. Goldman, Ph.D., *Chair*
Jeffrey M. Haydu, Ph.D.
Bennetta W. Jules-Rosette, Ph.D.
Rebecca E. Klatch, Ph.D.
Richard P. Madsen, Ph.D.
Timothy L. McDaniel, Ph.D., *Academic Senate Distinguished Teaching Award*
Hugh B. Mehan, Ph.D., *Academic Senate Distinguished Teaching Award*
David P. Phillips, Ph.D.
Andrew T. Scull, Ph.D.
Gershon Shafir, Ph.D.
John D. Skrentny, Ph.D.
Carlos H. Waisman, Ph.D.

Professors Emeriti

Bennett M. Berger, Ph.D.
Rae Lesser Blumberg, Ph.D.
Aaron V. Cicourel, Ph.D.
Jack D. Douglas, Ph.D.
Joseph R. Gusfield, Ph.D.
Jacqueline P. Wiseman, Ph.D.

Associate Professors

Richard G. Biernacki, Ph.D.
Maria Charles, Ph.D.
Steven G. Epstein, Ph.D.
Ivan T. Evans, Ph.D.
John H. Evans, Ph.D.
Paul Frymer, Ph.D.
Martha Lampland, Ph.D.
Akos Rona-Tas, Ph.D.

Christena Turner, Ph.D.
Leon Zamosc, Ph.D.

Assistant Professors

Amy J. Binder
Mary F. Blair-Loy
Andrew H. Lakoff, Ph.D.
April Linton *(Acting)*
Isaac Martin
Kwai Ng *(Acting)*

Adjunct Professors

Yen Espiritu, Ph.D.
Michael S. Schudson, Ph.D.
Susan Leigh Star, Ph.D.
Mary L. Walshok, Ph.D.

Lecturer

Stephen G. Lincoln, C. Phil., *Barbara J. and Paul D. Saltman Distinguished Teaching Award for Non-Senate Members*

Sociology at UCSD

Sociology studies societies and human groups: their composition, organization, culture, and development. It combines scientific and humanistic methods to investigate a subject that is both relevant and broad—ranging from social interaction in everyday life to social changes taking place on a global scale. The Department of Sociology at UCSD offers an innovative program that covers the breadth of the discipline while giving students opportunities to specialize in areas of their choice, to conduct independent research, and to participate in an Honors Program. The department also encourages majors to study abroad and to take courses in other humanities and social science departments in order to expand their perspective on sociological topics.

Students at UCSD can explore a full range of sociological inquiry through courses in such established fields as Third World development, law, culture, social movements, religion, race and ethnic relations, gender roles, medicine, and mental illness. In addition, students have the opportunity to participate in courses found in few other sociology departments, such as the politics of language, ethnographic film, the Holocaust, comparative sex stratification, mass media, and revolutions. The faculty also teach an exceptional array of courses focusing on specific societies or world regions, including Africa, Japan, China, Latin America, eastern Europe, the Soviet Union, and the United States.

Thus sociology is a valuable major for students who want to enter law, medicine, architecture, business, or politics. It also provides a solid liberal arts education for students who plan careers in such fields as criminal justice, public health, urban planning, social welfare, counseling, public administration, international relations, or market research. For students who wish to pursue graduate study in the social sciences for careers in teaching or scholarly research, an undergraduate degree from the Department of Sociology will provide a thorough grounding in recent theoretical and methodological advances in the discipline. A sociology major offers excellent preparation for teaching in the elementary schools. If you are interested in earning a California teaching credential from UCSD, contact the Teacher Education Program for information about the prerequisite and professional preparation requirements. It is recommended that you contact TEP as early as possible in your academic career. Whatever the career choice, the study of sociology can help the student cultivate a critical awareness of social life.

Students interested in majoring or minoring in sociology should stop by the Department of Sociology office, SSB 401, for a brochure on the program and a student handbook. These clarify specific procedures and guidelines, and provide recommendations for areas of specialization within the major, as well as for graduate studies and careers in sociology.

The Undergraduate Program

The Major

To receive a B.A. with a major in sociology, students must complete four lower-division and twelve upper-division courses in sociology, including the required courses listed below.

A 2.0 GPA is required in the major, and students must earn at least a C– in each course used for the major. *No courses taken to apply toward the major may be taken on a Pass/Not Pass basis except Sociology 197, 198 or 199.* Only one such special studies course (including internships) may be applied toward the major. These special studies courses must be applied for and approved by the department before the beginning of the quarter in which the student wishes to enroll, and can only be taken on a Pass/Not Pass basis. See the staff undergraduate coordinator for the necessary application forms and deadlines.

Lower-Division

Sociology 1A, 1B, 20, and 60 are required for the major. We strongly recommend that you take Sociology 1A and Sociology 1B in sequence. It is advisable that students complete these required lower-division courses (which should be taken during the freshman or sophomore year) before continuing with their upper-division work. Sociology 60 is a prerequisite for all upper-division methods courses.

Upper-Division

Twelve upper-division courses are necessary for the major—five are courses in required clusters, and the other seven are upper-division electives. The upper-division sociology curriculum is divided into four areas of concentration (clusters) as follows:

A. **Theory and Method**
(courses designated Soc/A)
Theory
100, 102, 103F, 103T
Methods
103M, 104, 105, 106, 107, 108A, 108B, 109, 109S, 110A, 110B

B. **Culture, Language, and Social Interaction**
(courses designated Soc/B)
111, 112, 113, 114, 116, 117, 118, 118A, 119, 120S, 128, 130, 131, 142, 143, 145, 146, 160, 161, 162, 162R, 164J, 166, 167, 170, 172, 173, 174

C. **Organizations and Institutions**
(courses designated Soc/C)
121, 123, 124, 126, 129, 132, 134A, 134B, 135, 136A, 136B, 137, 138A–B, 139, 140, 140F, 141, 144, 148, 148L, 148M, 152, 153, 154, 155, 156, 157, 159, 165A/B, 168E, 168T, 180

D. **Comparative and Historical**
(courses designated Soc/D)
151, 158, 158J, 169, 171, 177, 178, 179, 181, 182, 183, 185, 187, 187S, 188A, 188B, 188D, 188F, 188K, 189

All students must complete Sociology 100 (students are strongly advised to do so by the end of their junior year) and *one* method course from the list above. (Method courses are numbered Soc/A 103M to 110C; for all of these methods courses, Sociology 60 is a prerequisite.) *One* course is required in each of the other three

areas. Students are encouraged to complete their theory and methods courses early in their program, since theoretical perspectives and skills in methods will enhance their subsequent course work.

In fulfilling the major, students may apply, with the Department of Sociology approval, up to two upper-division courses from the relevant offerings in the Departments of Anthropology, Economics, History, Linguistics, Political Science, Psychology, Urban Studies and Planning, macro and micro areas of the Department of Communication, and the Teacher Education Program. Courses from departments other than these may be taken if the student submits a petition to, and obtains approval from, the Department of Sociology.

Education Abroad Program

Students are encouraged to participate in the UC Education Abroad Program (EAP) or UCSD's Opportunities Abroad Program (OAP) while still making progress toward completing their major. Students considering this option should discuss their plans with the undergraduate adviser prior to going abroad, and courses taken abroad must be approved by the department. It may be possible to use some related courses outside of the discipline of sociology toward the major. For more information on EAP, see the section of this catalog on the Education Abroad Program. Interested students should contact the Programs Abroad Office in the International Center. To petition particular courses taken abroad, see the undergraduate adviser in the Department of Sociology.

Recommendations for Transfer Students

If students wish to use courses taken at other institutions towards their major, they must first meet with the staff undergraduate coordinator in the department during designated office hours. (College transcripts, college catalogs, and course syllabi should be brought at the time of appointment.) Students are required to fill out one student petition per transfer course as well as an additional "information sheet" available in the Department of Sociology. Once these petitions are turned in, a determination will be made regarding the transferring of courses into the program.

It is important to note that eight of the twelve upper-division courses in the undergraduate program must be taken in the Department of Sociology at UCSD, unless students obtain special acceptance of additional courses from the chair and the faculty undergraduate adviser.

The Minor

The minor consists of seven sociology courses: two lower-division and five upper-division. Unless colleges specify specific courses to be taken, the student may choose any two lower-division sociology courses (Soc/L 1A, 1B, 10, 20, 30, 40 or 60) and any five upper-division courses (Soc. 100 to 190). Courses for the minor must be taken for a letter grade only. Special study courses or internships may not be applied toward the minor.

Science and Society Minor

OFFICE: 462 Social Science Building, (858) 534-2729

Faculty

Steven G. Epstein, Ph.D., *Associate Professor of Sociology*
Andrew T. Scull, Ph.D., *Professor of Sociology*

The Science and Society Minor offers an opportunity for students to examine in a systematic and extended fashion the nature, significance, and development of modern scientific, technological, and medical enterprises. Science, technology, and medicine permeate modern society, and scientific developments often spark heated public debate. Yet undergraduate education rarely offers the chance to engage in systematic reflection upon how science influences society and how society influences science. The Science and Society Minor provides students with an innovative and inter-linked series of courses that permit precisely such a disciplined discussion of these issues.

Students complete the Science and Society Minor by taking two lower-division and five upper-division courses, a sequence that allows them to explore how modern scientific and medical knowledge and their associated technologies developed from the Scientific Revolution to the present; to understand how the roles of the scientist and the physician assumed their modern forms; to grasp how the scientific, technological, and medical communities came to possess their current authority; and to consider the appropriate role of the public in debating scientific and technological issues. A number of the courses offered focus on present-day scientific, technological, and medical topics and controversies: the impact of the Internet, the problems and prospects of molecular medicine, the disputes over the reality and the possible impact of global warming, scientific fraud, the ethics of medical experimentation, the AIDS epidemic, etc. Others provide students with historical perspectives on the changing meaning and character of science, medicine, and technology as key features of modernity.

The Science and Society Minor is of particular relevance to prospective science and engineering majors interested in developing a broader understanding of the scientific enterprise; to premedical students wishing to understand the intellectual and institutional foundations of modern medicine; and to social science and humanities students wanting to obtain a systematic grasp of contemporary scientific and technological society.

Science and Society Minor Requirements

The minor consists of two lower-division courses and five upper-division courses, chosen from the list below. One or more relevant upper-division courses offered in other departments or taken at another university may be petitioned for the minor, with the prior approval of the coordinator of the minor.

LOWER-DIVISION COURSES

Soc/L 30: Science and Society

Soc/L 40: Sociology of Health Care Issues

UPPER-DIVISION COURSES

Soc/B 128: Media and Society: From the Invention of Print to the Internet

Soc/C 134A: The Making of Modern Medicine

Soc/C 134B: Medicine in the Twentieth Century

Soc/C 135: Medical Sociology

Soc/C 136A: Sociology of Mental Illness: An Historical Approach

Soc/C 136B: Sociology of Mental Illness in Contemporary Society

Soc/C 137: Knowledge and Practice in Biomedicine

Soc/C 168E: Sociology of Science

Soc/C 168T: Sociology of Technology

Soc/D 171: Science and the Making of the Modern World

The Honors Program

The Department of Sociology offers an honors program to those students who have demonstrated excellence in the sociology major.

Successful completion of the honors program enables the student to graduate "With Highest Distinction," "With High Distinction," or "With Distinction," depending upon performance in the program.

Eligibility

Students may apply to the honors program if they meet the following requirements:

1. junior standing (ninety units completed)
2. GPA of 3.5 or better in the major
3. recommendation of a faculty sponsor familiar with student's work
4. must have completed at least four upper-division sociology courses
5. overall GPA of 3.2 or better
6. must have completed Soc/A 100 and one upper-division methods course prior to the fall quarter when the honors course begins; alternatively, the consent of the honors program director or the undergraduate adviser must be obtained

Interested students may pick up an application from the staff undergraduate coordinator in the Department of Sociology. Completed applications must be in the department office no later than week five of the spring quarter prior to the start of the honors program in the fall.

Students traveling abroad during their junior year should note that the deadline for applications still applies to them and should make arrangements accordingly.

Enrollment in the honors program is limited. Final decisions on acceptance into the program will be made by the presiding faculty member.

Course Requirement

The student must take Sociology 196A, Advanced Studies in Sociology, and Sociology 196B, Supervised Thesis Research, which will count as two of the twelve upper-division courses required for the major. Each student will choose a faculty adviser to help supervise the thesis research and writing with the honors program director.

Students whose GPA in the major falls below 3.5 or who do not earn at least an A– in the honors seminars will not graduate with distinction, but they may count the two honors courses among the twelve upper-division courses required for the major. Students must maintain a 3.5 GPA in the major and a 3.2 overall GPA until final graduation, in order to receive honors in the sociology honors program. To graduate "With Highest Distinction" the student must earn an A+; to graduate "With High Distinction" the student must earn an A; and to graduate "With Distinction" the grade must be an A–.

The Graduate Program

The graduate program in sociology at the University of California, San Diego is organized on the basis of programs of specialization in comparative and historical sociology, the sociology of culture, and the sociology of science, technology, and medicine. It is designed to prepare students for two main goals: to contribute to the increase of knowledge about societies and thereby advance the discipline of sociology; and to teach sociology at the graduate and undergraduate levels. The majority of graduates from the program find teaching and research positions in colleges and universities, although some also work in non-academic research and social policy positions. The department offers a course of study leading to the doctor of philosophy degree. While the Master of Arts degree is awarded as a step toward the completion of the Ph.D., applicants seeking only an M.A. degree are not accepted.

Departmental Research and Teaching

Members of the department are engaged in a wide variety of research and teaching activities that fall into three broad areas of concentration that correspond to our programs of specialization:

COMPARATIVE AND HISTORICAL SOCIOLOGY

Many members of our faculty have research interests in the historical and/or comparative analysis of social institutions, structures, and processes, and social change in general. Using methods of comparative historical research and concepts drawn from social theory, individual faculty are engaged in research on, among other things: (1) political sociology, including revolution, social and political movements, and the evolution of the modern state, (2) economic transformation in contemporary societies (industrial countries, "emerging markets," and agrarian societies), including the labor process, stratification and the organization of work, and the development of market economies, (3) collective identities and social relations, including nationalism, class, gender, race, and ethnicity, and (4) social control and institutionalization. The department is among the most internationally oriented departments of sociology in the world, with specialists in most regions of the world, including Eastern and Western Europe, the former Soviet Union, Japan, China, southern Africa, Latin America, the Middle East, as well as the United States.

SOCIOLOGY OF CULTURE

A great number of the faculty have research and teaching interests in the sociology of culture broadly conceived. Sociology of culture involves topics such as: (1) the interpretation of the symbol systems that constitute meaningful resources for social action, (2) the analysis of the processes through which patterns of meaning are socially reproduced, and (3) the study of the interaction between culture change and social change. Many faculty have an interest in the comparative study of cultural traditions around the world. Others are interested in the relationship of culture to social movements and collective identities. And some see the sociology of culture not simply as a subdiscipline but as a general theoretical perspective on social experience. More specific substantive interests include sociology of knowledge and intellectuals, political culture, the culture of work, education and socialization, comparative moral cultures, the cultural dimensions of ethnicity, gender, sexuality, and popular culture.

SOCIOLOGY OF SCIENCE, TECHNOLOGY, AND MEDICINE

A substantial fraction of the faculty has research and teaching interests focused on the interrelationships between science, technology, and medicine and modern society. Drawing on a range of sociological and historical methodologies, individual faculty are engaged in research on science and social movements, scientists and the state, biomedicine, the social history of madness and psychiatry, the historical sociology of scientific knowledge and practice, and sociological approaches to the Scientific Revolution. (For information on the interdisciplinary Science Studies Program, see below Specialized Programs of Study.)

In addition, the department plans to add a fourth program of specialization in inequalities

(class, gender, and race). A substantial number of our faculty teach and do research in these fields.

Admission

Admission to the graduate program in sociology is open to students with excellent undergraduate records in any field. Some previous work in sociology or the social and behavioral sciences is advisable, but not required. New students are admitted in the fall quarter of each academic year. A bachelor's degree from an accredited college or university is a prerequisite for admission to the graduate program. Prospective applicants should submit the official application for admission and awards (same form), one set of official transcripts from each institution attended after high school, official scores from the Graduate Record Examination, application fee, at least three letters of recommendation, and one or more samples of the applicant's own writing, such as a term paper. Additionally, foreign applicants must submit official scores from the Test of English as a Foreign Language (TOEFL) and the Test of Written English (TWE). Applicants are encouraged to contact and communicate with the department to talk with faculty and graduate students. The application deadline is January 2, of each year.

Program of Study

The graduate programs in the University of California system work under the "normative time" standard. Normative time refers to the time period in which students, under normal circumstances, are expected to complete their requirements for the Ph.D. degree. Each department establishes a normative time for its doctoral program, and for the Department of Sociology, as for most graduate programs in the university, it is six years. To provide an incentive for students to complete the Ph.D. within the normative time period, partial fee grants are made to all students who have advanced to candidacy and whose accrued time does not exceed six years (eighteen quarters). Once a student exceeds six years, he or she must again pay the full fees quarterly until graduation.

COURSE REQUIREMENTS

Students are required to enroll as full-time graduate students, to carry a minimum enrollment of twelve units of graduate-level courses each quarter, and to maintain a grade-point average of 3.5 or better.

Theory and Methods Requirements

Students take almost all the courses on theory and methods in their first year in the program. They are required to take two courses in classical sociological theory (Sociology 201A/B) and one in contemporary theory (Sociology 202), two in quantitative methods (Sociology 205 and 206), and two in qualitative methods (from among Sociology 203, Field Methods; Sociology 204, Text and Discourse Analysis; Sociology 207, Comparative-Historical Methods; or Sociology 227, Ethnographic Film). In addition, students enroll in a two-credit introduction to the faculty and their research (Sociology 208, Faculty Research Seminar). Note: Sociology 208 is in addition to other requirements.

The remaining theory and methods requirements are Sociology 252 and 253, a two-quarter practicum, which will be taken in the second or third year. In these courses, students will complete a piece of research they have started in a previous seminar, write a paper, and revise it for submission to a journal. The emphasis in the first quarter will be on the completion of the research for this project, and the second quarter will focus on the writing of the results and revision of drafts.

Core Seminars

These are survey courses in major substantive fields. Students must take three out of the following eight, which the department offers regularly: Sociology 264, Economic Sociology; Sociology 226, Political Sociology; Sociology 216, Sociology of Culture; Sociology 234, Intellectual Foundations of the Study of Science, Technology, and Medicine; Sociology 212, Social Stratification; Sociology 267, Sociology of Gender; Sociology 244, Sociology of Race and Ethnicity; and Sociology 222, Social Movements. These are major areas of sociology and fields in which several of the members of our faculty specialize. Moreover, several of these seminars serve as introductions to the programs of specialization on which the program is based (see below).

Remaining Courses

Beyond these requirements, students must take six seminars, at least two of which must be in the program of specialization selected by the student. In total, eighteen graduate courses, plus the introduction to the faculty, are required for advancing to candidacy.

THE PROGRAMS OF SPECIALIZATION

The department currently offers specialized Ph.D. programs in comparative and historical sociology, sociology of culture, and the sociology of science, technology, and medicine. We are planning to establish a fourth program in social inequality (class, gender, and race). Affiliation to the clusters is voluntary and non-exclusive, and the department encourages multiple participation and joint activities among the groups. Students could qualify in more than one concentration, if they wish, and they will not be required to specialize in any one of them (although we are confident that most will find it advantageous to do so). The curriculum for each specialization is relatively light, in order to provide students with a solid common background in theory and methods, and allow for as much interface as possible between the programs. The requirements are: appropriate qualitative methods courses, one of the core seminars (see above) in areas relevant for the concentration, two specialized seminars, pertinent specialties for the field examination, and the dissertation.

The qualitative methods requirement varies according to the program of specialization. Students who concentrate in comparative and historical sociology must take Sociology 207, Comparative-Historical Methods. For sociology of culture, Sociology 203, Field Methods, is required. Finally, students specializing in sociology of science, technology, and medicine must choose two of the following three courses in qualitative methods: Sociology 203, Field Methods; Sociology 204, Text and Discourse Analysis; and Sociology 207, Comparative-Historical Methods. The required core seminars are survey courses in major substantive fields. Students must take three out of the following eight, which the department offers regularly: Sociology 264, Economic Sociology; Sociology 226, Political Sociology; Sociology 216, Sociology of Culture; Sociology 234, Intellectual Foundations of the Study of Science, Technology, and Medicine; Sociology 212, Social Stratification; Sociology 267, Sociology of Gender; Sociology 244, Sociology of Race and Ethnicity; and Sociology 222, Social Movements. These are major areas of sociology and fields in which several of the members of our faculty specialize. Moreover, several of these seminars serve as introduction to the programs of specialization on which the program is based.

The core seminars required for each program of specialization are the following:

Sociology 264, Economic Sociology or

Sociology 226, Political Sociology, for comparative and historical sociology

Sociology 216, Sociology of Culture, for sociology of culture

Sociology 234, Intellectual Foundations of the Study of Science, Technology, and Medicine, for sociology of science, technology, and medicine

PROGRAM OVERVIEW

First-year Evaluation

All students are evaluated by the department faculty toward the end of the academic year. At the end of the student's first year in the program, student performance is also evaluated by the Graduate Program Committee, including the director of Graduate Studies, the faculty teaching the core sequences, and by their faculty adviser. Students whose performance is satisfactory are allowed to continue the regular course of study; others may be asked to repeat some courses or to do additional coursework; others may be asked to withdraw from the program. Evaluations are communicated to students in writing.

Second-year Evaluation and the M.A. Degree

The master's degree is earned as one of the requirements of the Ph.D. and is based on the quality of the student's course work described below. At the end of the second year, students are evaluated by the Graduate Program Committee for the master's degree. At that time, the committee ascertains the student's suitability for doctoral work.

The 15 core courses required to receive the M.A. degree are:

Sociology 201A: Classical Sociological Theory I

Sociology 201B: Classical Sociological Theory II

Sociology 202: Contemporary Sociological Theory

Sociology 205: Quantitative Methods I

Sociology 206: Quantitative Methods II

Two courses chosen from:

Sociology 203: Field Methods

Sociology 204: Text and Discourse Analysis

Sociology 207: Comparative-Historical Methods

Three seminars from:

Sociology 212: Social Stratification

Sociology 216: Sociology of Culture

Sociology 222: Social Movements

Sociology 226: Political Sociology

Sociology 234: Intellectual Foundation of the Study of Science, Technology, and Medicine

Sociology 244: Sociology of Race and Ethnicity

Sociology 264: Economic Sociology

Sociology 267: Sociology of Gender

Five elective Sociology graduate seminars.

One may be outside the department and may be taken S/U

At the beginning of the spring quarter of their second year in the program or at the beginning of the quarter in which they wish to to be considered, students **must** submit to the committee for evaluation, three papers they have written for seminars taught by different faculty. Reviewers assess the quality of the overall record and determine whether it indicates a potential for conducting doctoral research.

The final decision regarding the M.A. degree is based on the student's GPA, the three papers, and yearly faculty evaluations. The committee makes one of the following three recommendations: pass, M.A. only , and non-pass. Pass means that students may proceed toward the Ph.D. Those given M.A. only evaluations are granted the degree but may not continue toward the Ph.D. Students who received non-pass evaluations are asked to withdraw without a graduate degree.

Students admitted for a Ph.D. with a master's degree in sociology may not be candidates for a second master's degree.

The Field Examination

In the quarter in which students expect to finish the theory and methods requirements, the three core seminars, and the six elective seminars, students become eligible to take the field examination. This examination **must be completed** by the end of the student's third year in the program. The object of the field examination is to demonstrate mastery of two established, broad, and distinct fields of sociological inquiry, selected from a list of fields provided by the department. The examination is carried out by a faculty committee composed of no fewer than four departmental faculty, one of whom serves as chair. The choice of fields and the composition of the committee **must be approved** by the Graduate Program Committee **before the student starts preparing for the exam.** Faculty from departments other than sociology may be added (or, if necessary, substituted) by petition to the Graduate Program Committee.

The demonstration of mastery has both written and oral components. The written part consists of two papers, one in each field, and a course syllabus for a course they would teach in one of the two fields in which they take their orals. In these papers, students are expected to demonstrate a grasp of key issues and debates, and of the broad, conceptual history of the field. These reviews are based on a bibliography drawn up by the student in consultation with relevant committee members and other faculty in each field. Students are expected to know the central arguments of all the books and papers in the bibliographies, regardless of the extent to which these books and articles have been used in the papers. Field papers **must** be a minimum of thirty and a maximum of fifty pages each, exclusive of notes and should include at least twenty to thirty books or article equivalents. The two bibliographies may not significantly overlap, either in literature surveyed or in specific titles. The papers, the bibliographies, and the syllabus **must** be submitted to the committee at least **two weeks before orals,** or the orals cannot go forward.

The oral part lasts two hours and covers both fields. It is given by the examining committee, sitting as a whole, and is based on the bibliographies, papers, and course syllabus submitted by the student. The exam does not focus on the papers, but on the students' knowledge of the fields. Following the oral examination, the committee evaluates the student on the basis of both the written and the oral components of the examination. Possible grades are high pass, pass, conditional pass, and no pass. High pass recognizes exceptional performance. Conditional pass indicates that the committee has passed the student pending the completion of additional work. Students receiving a grade of no pass will have an opportunity to retake the examination, should they so desire, no later than the end of the subsequent quarter. Students electing not to retake the examination or receiving a grade of no pass a second time will be asked to withdraw from the graduate program.

Students will have to constitute their field exam committee **two months** before the proposed date of the exam. Once the committee is constituted it can be changed only if a faculty member becomes unavailable. Students will have to submit one copy per member of a substantial draft of their field papers **one month in advance** to the graduate coordinator, who then distributes them to the committee members.

Faculty, in, turn will commit to read and comment on the papers in two weeks time.

All papers (as opposed to the drafts) and the syllabus must be submitted to the committee **two weeks before** the fields.

The Dissertation Prospectus and Hearing

The central intellectual activity leading to the award of the Ph.D. degree is the doctoral dissertation: an original contribution to knowledge, based on substantial, original research on a topic of intellectual significance within the field of sociology.

Following successful completion of the field examination, the student establishes a doctoral committee to supervise dissertation research. This is a five-person committee, including three faculty from within the department and two from other departments within the university. The committee should include the faculty members whose fields of expertise make them most appropriate for supervising the students' research. The student approaches the faculty member he or she would like to include, but the committee **must** be approved by the director of Graduate Studies and the department chair **before** the student starts working on the prospectus. The composition of the committee may or may not overlap with the committee that carried out the field examination. If the student elects to have six member committee, the sixth member has all the same obligations as the other committee members.

By the end of the spring quarter of the fourth year in the department, the student must have a dissertation prospectus approved by his or her doctoral committee. The dissertation prospectus is a document that presents the research topic of the dissertation, places it in the context of the relevant literature, discusses its significance, specifies and justifies the methods the student intends to use, establishes the feasibility of the research, and indicates the anticipated steps leading to completion.

Following submission of the dissertation prospectus, the student must defend it at a hearing before the doctoral committee. The purpose of the hearing is to certify that the prospectus is significant and feasible, that the research design is appropriate, and that the student is prepared to carry it out successfully. Based on the written prospectus and the hearing, the committee may choose to approve the prospectus or to ask for revisions and resubmission. The prospectus hearing serves, in effect, as a qualifying examination, and approval of the dissertation prospectus is the final step to advancement to candidacy for the Ph.D. degree.

Students will have to constitute their dissertation committee **three months** before the proposed date of the exam. Once the committee is constituted it can be changed only if a faculty member becomes unavailable. Students will have to submit one copy per member of a substantial draft of their prospectus **one month in advance** to the graduate coordinator, who then distributes them to the committee members. Faculty in turn, will commit to read and comment on the papers in two weeks time.

The Doctoral Dissertation

Upon approval of the dissertation prospectus, the student proceeds with dissertation research. Students are expected to consult with committee members as the research progresses and to keep the committee chair advised of progress made.

Once the dissertation is substantially completed and committee members have had the opportunity to review drafts of the written work, the committee meets at least one month before the defense takes place, with or without the student present, to consider the progress made and to identify concerns, changes to be made, or further work to be done. Once the committee members are substantially satisfied with the written work, the student, in consultation with the committee, schedules the oral defense of the dissertation. By university regulation, this defense is open to the public.

The final version of the dissertation must be approved by each member of the doctoral committee. **All** members of the committee **must** be present at the defense. Exceptions may be made **only** under very restrictive conditions. Further, the student **must** consult with the Office of Graduate Studies and Research to be told of appropriate requirements for the thesis to be filed. Having obtained this approval and successfully defended the dissertation in oral examination, the student is eligible to receive the Ph.D. degree. The final version of the dissertation is then filed with the university librarian via the Office of Graduate Studies and Research. Acceptance of the dissertation by the university librarian is the final step in completing all requirements for the Ph.D.

Ph.D. Time Limit Policies

Students must be advanced to candidacy by the end of four years (PCTL—Precandidacy Time Limit). Normative time is six years. Total university financial support (SUTL—Support Time Limit) cannot exceed seven years. Total registered (TRTL—Total Registered Time Limit) time at UCSD cannot exceed eight years.

Interdisciplinary Programs of Study

SOCIOLOGY OF SCIENCE, TECHNOLOGY, AND MEDICINE AND THE SCIENCE STUDIES PROGRAM

Students interested in the interrelationships between science, technology, and medicine (STM) and the larger social order can opt for one of two specialized programs of study. The first of these is undertaken wholly within the department (see above). The second approach is to seek admission to the Science Studies Program, a joint doctoral program that brings together graduate students from the Departments of Sociology, History, Philosophy, and Communication. Students in the Program pursue a cross-disciplinary curriculum leading to dissertation research in the sociology of science, technology, or medicine, broadly conceived. Sociology faculty affiliated with this Program have research interests across the broad spectrum of science studies, from the philosophy and history of science to the organization of scientific discovery and the culture of specific work.

Students may seek admission to the Science Studies Program at the same time they apply for admission to the Department of Sociology, or may, in certain circumstances, request to be accepted into the Program at some point after entering the University of California, San Diego. The requirements of the Science Studies Program are similar to those of the standard graduate program. However, there are some distinct curricular requirements in the first two years of the Program, as well as some distinct emphases in the qualifying examination. The core of the Program is a two-quarter team-taught seminar sequence taken in the first year, the first quarter being an interdisciplinary introduction to science studies and the second quarter (or core seminar) being devoted to special topics in science studies which vary from year to year.

For details on the Science Studies Program, including information about requirements,

write to the University of California, San Diego, Coordinator, Science Studies Program 0104, 9500 Gilman Drive, La Jolla, CA 92093-0104; or telephone the program coordinator at (858) 534-0491. Visit their Web site: http://sciencestudies.ucsd.edu

INTERDISCIPLINARY PROGRAM IN SOCIOLOGY AND COGNITIVE SCIENCE

This program allows students to earn a Ph.D. in sociology and cognitive science. Students must complete all the regular sociology requirements. In addition, they take six cognitive science seminars and select a dissertation committee composed of three Sociology and three Cognitive Science Program faculty. Admission to this program requires a separate application and is contingent on acceptance into the Sociology Department. For more information, contact the coordinators in the Sociology Department, (858) 534-4626, (jrudolph@ucsd.edu) or the Cognitive Science Department, (858) 534-7141, (rburrola@ucsd.edu). Please view our Web site for application and department handbook information: http://dssadmin.ucsd.edu/sociology/gbroch.htm.

COURSES

LOWER-DIVISION

Soc/L 1A. The Study of Society (4)
An introduction to the organizing themes and ideas, empirical concerns, and analytical approaches of the discipline of sociology. The course focuses on both classical and contemporary views of modern society, on the nature of community, and on inequality, with special attention to class, race, and gender. Materials include both theoretical statements and case studies. *(This is a required course for the sociology major. It is normally offered fall quarter.)*

Soc/L 1B. The Study of Society (4)
A continuation of Sociology/L 1A. The focus here is on socialization processes, culture, social reproduction and social control, and collective action. As in 1A, materials include both theoretical statements and case studies. While 1B may be taken as an independent course, it is recommended that students take 1A and 1B in sequence, as the latter builds on the former. *(This is a required course for the sociology major. It is normally offered winter quarter.)*

Soc/L 10. American Society: Social Structure and Culture in the United States (4)
An introduction to American society in historical, comparative, and contemporary perspectives. Topics will include American cultural traditions; industrialization; class structure; the welfare state; ethnic, racial, and gender relations; the changing position of religion; social movements; and political trends.

Soc/L 20. Social Change in the Modern World (4)
A survey of the major economic, political, and social forces that have shaped the contemporary world. The course will provide an introduction to theories of social change, as well as prepare the student for upper-division work in comparative-historical sociology. *(This is a required course for the sociology major.)*

Soc/L 30. Science, Technology, and Society (4)
A series of case studies of the relations between society and modern science, technology, and medicine. Global warming, reproductive medicine, AIDS, and other topical cases prompt students to view science-society interactions as problematic and complex.

Soc/L 40. Sociology of Health Care Issues (4)
Designed as a broad introduction to medicine as a social institution and its relationship to other institutions as well as its relation to society. It will make use of both micro and macro sociological work in this area and introduce students to sociological perspectives of contemporary health care issues.

Soc/L 60. The Practice of Social Research (4)
This course introduces students to the fundamental principles of the design of social research. It examines the key varieties of evidence, sampling methods, logic of comparison, and causal reasoning researchers use in their study of social issues. *(This is a required course for the sociology major.)*

Soc/L 87. Freshman Seminar (1)
The Freshman Seminar Program is designed to provide new students with the opportunity to explore an intellectual topic with a faculty member in a small seminar setting. Freshman seminar topics will vary from quarter to quarter. Enrollment is limited to fifteen to twenty students, with preference given to entering freshmen.

Soc/L 90. Undergraduate Seminar (1)
This seminar will focus on a variety of current issues and special areas in the field of sociology, and will be focussed in particular on students of freshman status. Content will vary from year to year. (P/NP grades only.) *Prerequisite: freshman status.*

Soc/L 98. Directed Group Study (4)
Small group study and research under the direction of an interested faculty member in an area not covered in regular sociology courses. (P/NP grades only.) *Prerequisites: lower-division standing; completion of thirty units of UCSD undergraduate study; minimum UCSD GPA of 3.0; completion and approval of Special Studies form. Consent of instructor and department approval required.*

Soc/L 99. Independent Study (4)
Individual study and research under the direction of an interested faculty member. P/NP grades only. *Prerequisites: lower-division standing; completion of thirty units of UCSD undergraduate study; minimum UCSD GPA of 3.0; completion and approval of Special Studies form. Consent of instructor and department approval required.*

CLUSTER A: THEORY AND METHODS

Theory

Soc/A 100. Classical Sociological Theory (4)
Major figures and schools in sociology from the early nineteenth century onwards, including Marx, Tocqueville, Durkheim, and Weber. The objective of the course is to provide students with a background in classical social theory, and to show its relevance to contemporary sociology. *Prerequisite: upper-division standing. (This is a required course for the sociology major.)*

Soc/A 102. Contemporary Sociological Theory (4)
An analysis of leading theories in sociology with an emphasis on contemporary perspectives. Theoretical approaches include functionalism, Marxism, systems analysis, and interpretive sociology. *Prerequisite: upper-division standing.*

Soc/A 103F. Feminist Criticism and Social Theory (4)
This course will examine recent contributions to social theory from feminist critics and scholars. Theoretical writings will be paired with empirical studies illustrating the development and application of these ideas. The central concern of these investigations will be to reconcile new theories of subjectivity and multiple social worlds with classical understandings of society as a coherent body of practices. *Prerequisite: upper-division standing.*

Methods

Soc/A 103M. Computer Applications to Data Management in Sociology (4)
Develop skills in computer management and analysis of sociological data. Practical experience with data produced by sociological research. Students will develop competency in the analysis of sociological data, by extensive acquaintance with computer software used for data analysis and management (e.g., SPSS). *Prerequisite: Soc/L 60. Will satisfy method requirement in Cluster A.*

Soc/A 104. Field Research: Methods of Participant Observation (4)
Relationship between sociological theory and field research. Strong emphasis on theory and methods of participant observation: consideration of problems of entry into field settings, recording observations, description/analysis of field data, ethical problems in field work. Required paper using field methods. *Prerequisite: Soc/L 60; majors only. Will satisfy method requirement in Cluster A.*

Soc/A 105. Ethnographic Film: Media Methods (6)
(Conjoined with Soc/G 227.) Ethnographic recording of field data in written and audiovisual formats including film, video, and CD ROM applications. Critical assessment of ethnographies and audiovisual ethnographic videotape. *Prerequisite: graduate standing or consent of instructor for Soc/G 227 and SocL/60 for Soc/A 105. Will satisfy method requirement in Cluster A.*

Soc/A 106. Comparative and Historical Methods (4)
A broad-based consideration of the use of historical materials in sociological analysis, especially as this facilitates empirically oriented studies across different societies and through time, and their application in student research projects. *Prerequisite: Soc/L 60. Will satisfy method requirement in Cluster A.*

Soc/A 107. Epidemiological Methods: Statistical Study of Disease (4)
Epidemiology is the statistical study of disease, and epidemiological methods are a powerful tool for understanding the causes of certain diseases, e.g., AIDS, scurvy, cholera, and lung cancer. These fundamental epidemiological methods will be taught. *Prerequisite: Soc/L 60.*

Soc/A 108A. Survey Research Design (4)
Translation of research goals into a research design, including probability sampling, questionnaire construction, data collection (including interviewing techniques), data processing, coding, and preliminary tabulation of data. Statistical methods of analysis will

be limited primarily to percentaging. *Prerequisite: Soc/L 60. Will satisfy method requirement in Cluster A.*

Soc/A 108B. Quantitative Analysis of Survey Data (4)
Quantitative analysis of survey research data through computer-based student participation in the research process. Emphasis on index and scale construction and on univariate, bivariate, and multivariate types of analysis, including some standard descriptive and inferential statistics. *Prerequisite: Soc/L 60. Will satisfy method requirement in Cluster A.*

Soc/A 109. Analysis of Sociological Data (4)
Students test their own sociological research hypotheses using data from recent American and International social surveys and state-of-the-art computer software. Application of classical scientific method, interpretation of statistical results, and clear presentation of research findings. *Prerequisite: Soc/L 60. Will satisfy method requirement for Cluster A.*

Soc/A 109S. Special Topics in Methods (4)
Readings and discussions of particular methodological issues in sociology. Topics will vary from year to year, depending on the current research of regular faculty or visiting faculty. *Prerequisite: upper-division standing. Will satisfy method requirement in Cluster A.*

Soc/A 110A-B. Qualitative Research in Educational Settings (4-4)
Basic understanding of participant observation, interviewing, and other ethnographic research techniques through field experiences in school and community settings sponsored by CREATE. Students will learn to take field notes, write-up interviews, and compose interpretive essays based on their field experiences. *Prerequisite: Soc/L 60; Soc/A 110A is a prerequisite for Soc/A 110B. Will satisfy method requirement in Cluster A.*

CLUSTER B: CULTURE, LANGUAGE, AND SOCIAL INTERACTION

Soc/B 111A. Human Rights: Principles and Problems (4)
An inquiry into the concept of human rights, the history of human rights in the twentieth century, and problems in both the concept and its implementa-tion in modern societies. *Prerequisite: upper-division standing.*

Soc/B 111B. Human Rights: Practices and Cases (4)
An investigation into human rights practices in contemporary society, focusing on abuses and understanding both their causes and responses to them. We will look at several key cases, probably including the Islamic world and East Asia. *Prerequisite: upper-division standing.*

Soc/B 112. Social Psychology (4)
This course will deal with human behavior and personality development as affected by social group life. Major theories will be compared. The interaction dynamics of such substantive areas as socialization, normative and deviant behavior, learning and achievement, the social construction of the self, and the social identities will be considered. *Prerequisite: upper-division standing.*

Soc/B 113. Sociology of the AIDS Epidemic (4)
This course considers the social, cultural, political, and economic aspects of HIV/AIDS. Topics include the social context of transmission; the experiences of women living with HIV; AIDS activism; representations of AIDS; and the impact of race and class differences. *Prerequisite: upper-division standing.*

Soc/B 114. Culture and Ethnicity (4)
Examines culture and inter-ethnic relations, the links between culture and ethnic variations in socio-economic achievement, and the intersection of culture and ethnicity with politics and policy. Topics include intermarriage, ethnic conflict, multicultural education and affirmative action. *Prerequisite: upper-division standing.*

Soc/B 115. Social Problems (4)
Analyzes selected social problems in the United States, such as those regarding education, race relations, and wealth inequality, from various sociological perspectives, and also examines the various sites of debate discussion, like political institutions, TV and other media, and religious institutions. *Prerequisite: upper-division standing.*

Soc/B 116. Gender and Poverty (4)
This course examines theoretical arguments, current policy debates, and empirical research concerning gender and poverty. The course provides an intellectual framework for understanding issues central to women's poverty, including family structure, reproduction, childcare, employment, and aging. Race and ethnicity are central. Particular attention is given to women and children in female-headed households. *Prerequisite: upper-division standing.*

Soc/B 117. Language, Culture, and Education (4)
(Same as TEP 117.) The mutual influence of language, culture, and education will be explored; explanations of students' school successes and failures that employ linguistic and cultural variables will be considered; bilingualism; cultural transmission through education. *Prerequisite: upper-division standing.*

Soc/B 118. Sociology of Gender (4)
An analysis of the social, biological, and psychological components of becoming a man or a woman. The course will survey a wide range of information in an attempt to specify what is distinctively social about gender roles and identities; i.e., to understand how a most basic part of the "self"–womanhood or manhood–is socially defined and socially learned behavior. *Prerequisite: upper-division standing.*

Soc/B 118A. Gender and Language in Society (4)
(Same as LIGN 174.) This course examines how language contributes to the social construction of gender identities, and how gender impacts language use and ideologies. Topics include the ways language and gender interact across the life span (especially childhood and adolescence); within ethnolinguistic minority communities; and across cultures. *Prerequisite: upper-division standing.*

Soc/B 119. Sociology of Sexuality and Sexual Identities (4)
Introduction both to the sociological study of sexuality and to sociological perspectives in gay/lesbian studies. Examines the social construction of sexual meanings, identities, movements, and controversies; the relation of sexuality to other institutions; and the intersection of sexuality with gender, class, and race. *Prerequisite: upper-division standing.*

Soc/B 120S. Special Topics in Culture, Language, and Social Interaction (4)
This course will examine key issues in culture, language, and social interaction. Content will vary from year to year. *Prerequisite: upper-division standing.*

Soc/B 122. Jerusalem: Sacred and Profane (4)
Examining Jerusalem as world historical city and religious/political center. Focus on Jerusalem's modernization/architecture since Crimean War; struggles over its holy sites between Muslims, Jews, Eastern and Western Christians; its character as an ethnic frontier; the city in memory. *Prerequisite: upper-division standing.*

Soc/B 128. Media and Society: From the Invention of Print to the Internet (4)
It is no coincidence that the development of printed commun- ication has coincided with that of modern society. This course examines the connections between the two, tracing the historical sociology of print culture from the invention of the press to the communications revolution now at hand. *Prerequisite: upper-division standing.*

Soc/B 130. Interdisciplinary Approaches to Lesbian, Gay, Bisexual and Transgender Studies (4)
(Same as LTCS 135.) Introduction to the interdisciplinary examination of human sexuality and, especially, lesbian, gay, bisexual, and transgender identities and desires. Juxtaposes perspectives from the humanities, social sciences, and natural sciences, and introduces recent queer theory, to understand sexuality in relation to phenomena such as government, family, culture, medicine, race, gender, and class. *Prerequisite: upper-division standing.*

Soc/B 131. Sociology of Youth (4)
Chronological age and social status; analysis of social processes bearing upon the socialization of children and adolescents. The emergence of "youth cultures," generational succession as a cultural problem. *Prerequisite: upper-division standing.*

Soc/B 142. Social Deviance (4)
This course studies the major forms of behavior seen as rule violations by large segments of our society and analyzes the major theories trying to explain them, as well as processes of rule making, rule enforcing, techniques of neutralization, stigmatization and status degradation, and rule change. *Prerequisite: upper-division standing.*

Soc/B 143. Suicide (4)
Traditional and modern theories of suicide will be reviewed and tested. The study of suicide will be treated as one method for investigating the influence of society on the individual. *Prerequisite: upper-division standing.*

Soc/B 145. Violence and Society (4)
Focusing on American history, this course explores violence in the light of three major themes: struggles over citizenship and nationhood; the drawing and maintenance of racial, ethnic, and gender boundaries; and the persistence of notions of "masculinity" and its relation to violence. *Prerequisite: upper-division standing.*

Soc/B 146. Law Enforcement in America (4)
Provides a sociological understanding of policing in practice in the United States. Examines the social, political, and historical forces behind the development and shaping of policing in America—including the functions of police, the "working personality" of police officers, as well as police misconduct and its control. *Prerequisite: upper-division standing.*

Soc/B 160. Sociology of Culture (4)
This course will examine the concept of culture, its "disintegration" in the twentieth century, and the repercussions on the integration of the individual. We will look at this process from a variety of perspectives, each focusing on one cultural fragment (e.g., knowledge, literature, religion) and all suggesting various

means to reunify culture and consequently the individual. *Prerequisite: upper-division standing.*

Soc/B 161. Sociology of the Life Course (4)
This course explores concepts, theory and empirical research related to demographic, socio-psychological, and institutional aspects of the different stages of human development. It considers social influences on opportunities and constraints by gender, class, race/ethnicity, and historical period. *Prerequisite: upper-division standing.*

Soc/B 162. Popular Culture (4)
An overview of the historical development of popular culture from the early modern period to the present. Also a review of major theories explaining how popular culture reflects and/or affects patterns of social behavior. *Prerequisite: upper-division standing.*

Soc/B 162R. Religion and Popular Culture in East Asia (4)
(Same as HIEA 119.) Historical, social, and cultural relationships between religion and popular culture. Secularization of culture through images, worldviews, and concepts of right and wrong, which may either derive from or pose challenges to the major East Asian religions. *Prerequisite: upper-division standing.*

Soc/B 166. Sociology of Knowledge (4)
This course provides a general introduction to the development of the sociology of knowledge, and will explore questions concerning social determination of consciousness as well as theoretical ways to articulate a critique of ideology. *Prerequisite: upper-division standing.*

Soc/B 170. Sociology of Art (4)
(Conjoined with SOCG 263) This seminar explores the production and interpretation of art forms in cross-cultural context. Processes of symbolic and economic exchange in art worlds will be examined from sociological and semiotic perspectives. Contemporary and popular art forms will be analyzed as types of cultural reproduction. Graduate students will be required to submit a proposal abstract and final research paper of twenty-seven pages; undergraduates must complete a project and eleven-page paper. *Prerequisite: upper-division standing.*

Soc/B 172. Films and Society (4)
An analysis of films and how they portray various aspects of American society and culture. *Prerequisite: upper-division standing.*

Soc/B 173. Elite Crime (4)
Explores theoretical and conceptual dimensions in the analysis of the systematic violation of the laws and ethics of business and politics in the United States. Covers a range of illegal and unethical practices, the social and political advantages of such violators, as well as the historical bias in both theory and research that has contributed to our lack of understanding of such issues in sociology and criminology. *Prerequisite: upper-division standing.*

Soc/B 174. Sociology of Literature (4)
Literature will be discussed in the context of the ideas of national and regional culture, "historical situation," and "social order." Other issues to be studied are literary men and women as spokespersons and as rebels, literary movements and social conditions, and literary works as social documents. *Prerequisite: upper-division standing.*

CLUSTER C: SOCIAL ORGANIZATION AND INSTITUTIONS

Soc/C 121. Economy and Society (4)
An examination of a central concern of classical social theory; the relationship between economy and society, with special attention (theoretically and empirically) on the problem of the origins of modern capitalism. The course will investigate the role of technology and economic institutions in society; the influence of culture and politics on economic exchange, production, and consumption; the process of rationalization and the social division of labor; contemporary economic problems and the welfare state. *Prerequisite: upper-division standing.*

Soc/C 123. Sociology of Work (4)
A comparative analysis of work in contemporary industrial economies. Topics include: the division of labor in manufacturing and the changing structure of the working class, social and political consequences of skill and wage differentials, bureaucratization and determinants of job satisfaction, trade unions and their strategies, industrial conflict, labor movements, and the relationships between unions and political parties. *Prerequisite: upper-division standing.*

Soc/C 124. Business and Society (4)
This course places business organization and practices in their social setting. Topics include the relationship between business and government; the mutual impact of business and labor (union and nonunion); the interplay of business values and popular culture; and business and "globalization." Primary focus will be on the United States, past and present. *Prerequisite: upper-division standing.*

Soc/C 126. Social Organization of Education (4)
(Same as TEP 126.) The social organization of education in the U.S. and other societies; the functions of education for individuals and society; the structure of schools; educational decision making; educational testing; socialization and education; formal and informal education; cultural transmission. *Prerequisite: upper-division standing.*

Soc/C 129. The Family (4)
An examination of historical and social influences on family life. Analyzes contemporary families in the United States, the influences of gender, class, and race, and current issues such as divorce, domestic violence, and the feminization of poverty. *Prerequisite: upper-division standing.*

Soc/C 132. Gender and Work (4)
Examination and analysis of empirical research and theoretical perspectives on gender and work. Special attention to occupational segregation. Other topics include: the interplay between work and family; gender, work and poverty; gender and work in the Third World. *Prerequisite: upper-division standing.*

Soc/C 134A. The Making of Modern Medicine (4)
A study of the social, intellectual, and institutional aspects of the nineteenth-century transformation of clinical medicine, examining both the changing content of medical knowledge and therapeutics, and the organization of the medical profession. *Prerequisite: upper-division standing.*

Soc/C 134B. Medicine in the Twentieth Century (4)
A study of major intellectual and institutional changes in medicine in the twentieth century, place in their sociological context. The primary emphasis of the course will be on developments in North America and Britain. *Prerequisite: upper-division standing.*

Soc/C 135. Medical Sociology (4)
An inquiry into the roles of culture and social structure in mediating the health and illness experiences of individuals and groups. Topics include the social construction of illness, the relationships between patients and health professionals, and the organization of medical work. *Prerequisite: upper-division standing.*

Soc/C 136A. Sociology of Mental Illness: An Historical Approach (4)
An examination of the social, cultural, and political factors involved in the identification and treatment of mental illness. This course will emphasize historical material, focusing on the eighteenth, nineteenth, and early twentieth centuries. Developments in England as well as the United States will be examined from an historical perspective. *Prerequisite: upper-division standing.*

Soc/C 136B. Sociology of Mental Illness in Contemporary Society (4)
This course will focus on recent developments in the mental illness sector and on the contemporary sociological literature on mental illness. Developments in England as well as the United States will be examined. *Prerequisite: upper-division standing.*

Soc/C 137. Knowledge and Practice in Biomedicine (4)
This course focuses on the biomedical research enterprise in its relationship to medical practice. Topics include the construction of medical knowledge, the resolution of controversies, the organization of medical work, and the cultural authority of biomedicine. *Prerequisite: any lower- or upper-division course on the sociology of medicine or science, or consent of instructor.*

Soc/C 138. Genetics and Society (4)
The class will first examine the direct social effects of the "genetic revolution": eugenics, genetic discrimination, and stratification. Second, the implications of thinking of society in terms of genetics, specifically—sociobiology, social Darwinism, evolutionary psychology, and biology. *Prerequisite: upper-division standing.*

Soc/C 138A-B. Civic Participation (4-4)
(Same as COSF 125A-B) What are the sources of political apathy and political engagement? What are the variety of ways Americans express civic involvement and political concern? Primary focus will be on the contemporary United States, but with substantial attention to comparative and historical perspectives. This will be run as a research seminar. Students will write literary-based or fieldwork-based empirical research papers of twenty-five to forty pages.

Soc/C 139. Social Inequality: Class, Race, and Gender (4)
Massive inequality in wealth, power, and prestige is ever-present in industrial societies. In this course, causes and consequences of class, gender, racial and ethnic inequality ("stratification") will be considered through examination of classical and modern social science theory and research. *Prerequisite: upper-division standing.*

Soc/C 140. Sociology of Law (4)
This course analyzes the functions of law in society, the social sources of legal change, social conditions affecting the administration of justice, and the role of social science in jurisprudence. *Prerequisite: upper-division standing.*

Soc/C 140F. Law and the Workplace (4)
This course examines how the U.S. legal system has responded to workplace inequality and demands for employee rights. Particular attention is given to racial, gender, religious, and disability discrimination, as well as the law's role in regulating unions, the global economy, and sweatshop labor. *Prerequisite: upper-division standing.*

Soc/C 141. Crime and Society (4)
A study of the social origins of criminal law, the administration of justice, causes and patterns of criminal behavior, and the prevention and control of crime, including individual rehabilitation and institutional change, and the politics of legal, police, and correctional reform. *Prerequisite: upper-division standing.*

Soc/C 144. Forms of Social Control (4)
The organization, development, and mission of social control agencies in the nineteenth and twentieth centuries, with emphasis on crime and madness; agency occupations (police, psychiatrists, correctional work, etc.); theories of control movements. *Prerequisite: upper-division standing.*

Soc/C 147. Organizations, Society, and Social Justice (4)
Organizations are dynamic forces in society. This course examines how organizations address human health and social justice issues in national and international settings, focusing on the links between internal dynamics of organizations and macro-level political, economic, and cultural factors. *Prerequisite: upper-division standing.*

Soc/C 148. Political Sociology (4)
Course focuses on the interaction between state and society. It discusses central concepts of political sociology (social cleavages, mobilization, the state, legitimacy), institutional characteristics, causes, and consequences of contemporary political regimes (liberal democracies, authoritarianism, communism), and processes of political change. *Prerequisite: upper-division standing.*

Soc/C 148L. Inequality and Jobs (4)
Some people do much better than others in the world of work. Causes and consequences of this inequality will be examined: How do characteristics of individuals (e.g., class, gender, race, education, talent) and characteristics of jobs affect market outcomes? *Prerequisite: upper-division standing.*

Soc/C 149. Sociology of the Environment (4)
The "environment" as a socially and technically shaped milieu in which competing values and interests play out. Relation of humanity to nature; conflicts between preservation and development; environmental pollution and contested illnesses.

Soc/C 152. Social Inequality and Public Policy (4)
(Same as USP 133.) Primary focus on understanding and analyzing poverty and public policy. Analysis of how current debates and public policy initiatives mesh with alternative social scientific explorations of poverty. *Prerequisite: upper-division standing.*

Soc/C 153. Urban Sociology (4)
(Same as USP 105) Introduces students to the major approaches in the sociological study of cities and to what a sociological analysis can add to our understanding of urban processes. *Prerequisite: upper-division standing or consent of instructor.*

Soc/C 154. Religious Institutions in America (4)
Examination of sociological theories for why people have religious beliefs. Also examines types of religious organizations, secularization, fundamentalism, religion and immigration, religion and politics, and religiously inspired violence and terrorism. The class will tend to focus on the American context. *Prerequisite: upper-division standing.*

Soc/C 155. The City of San Diego (4)
A research-oriented course studying a specific city. Students will describe and analyze a local community of San Diego. Additional work on one citywide institution. Guest lecturers from San Diego organizations and government. Readings largely from city reports and news media. *Prerequisite: introductory sociology.*

Soc/C 156. Sociology of Religion (4)
Diverse sociological explanations of religious ideas and religious behavior. The social consequences of different kinds of religious beliefs and religious organizations. The influence of religion upon concepts of history, the natural world, human nature, and the social order. The significance of such notions as "sacred peoples" and "sacred places." The religious-like character of certain political movements and certain sociocultural attitudes. *Prerequisite: upper-division standing.*

Soc/C 157. Religion in Contemporary Society (4)
Sacred texts, religious experiences, and ritual settings are explored from the perspective of sociological analysis. The types and dynamic of religious sects and institutions are examined. African and contemporary U.S. religious data provide resources for lecture and comparative analysis. *Prerequisite: upper-division standing.*

Soc/C 159. Special Topics in Social Organizations and Institutions (4)
Readings and discussion of particular substantive issues and research in the sociology of organizations and institutions–including such areas as population, economy, education, family, medicine, law, politics, and religion. Topics will vary from year to year. *Prerequisite: upper-division standing.*

Soc/C 165A-B. American News Media (4-4)
History, politics, social organization, and ideology of the American news media. 165A surveys the development of the news media as an institution, from earliest newspapers to modern mass news media. 165B deals with special topics, including the nature of television news, with methods of news media research, and requires a research paper. *Prerequisite: Soc/L 1A or consent of instructor; Soc/C 165B requires Soc/C 165A.*

Soc/C 168E. Sociology of Science (4)
A survey of theoretical and empirical studies concerning the workings of the scientific community and its relations with the wider society. Special attention will be given to the institutionalization of the scientific role and to the social constitution of scientific knowledge. *Prerequisite: upper-division standing.*

Soc/C 168T. Sociology of Technology (4)
An introduction to classic and recent sociological perspectives on technology, giving special attention to the relations between technology and science, technology and work, and technology and politics. *Prerequisite: upper-division standing.*

Soc/C 180. Social Movements and Social Protest (4)
An examination of the nature of protests and violence, particularly as they occur in the context of larger social movements. The course will further examine those generic facets of social movements having to do with their genesis, characteristic forms of development, relationship to established political configurations, and gradual fading away. *Prerequisite: upper-division standing.*

CLUSTER D: COMPARATIVE AND HISTORICAL SOCIOLOGY

Soc/D 151. Comparative Race and Ethnic Relations (4)
An historical and comparative analysis of race and ethnic relations in various national settings, with emphasis on the United States. The course will analyze the origins of ethnic stratification systems, their maintenance, the adaptation of minority communities, and the role of reform and revolutionary movements and government policies in promoting civil rights and social change. *Prerequisite: upper-division standing.*

Soc/D 158. Islam in the Modern World (4)
The role of Islam in the society, culture, and politics of the Muslim people during the nineteenth and twentieth centuries; attempts by Muslim thinkers to accommodate or reject rival ideologies (such as nationalism and socialism); and a critical review of the relationship between Islam and the West. *Prerequisite: upper-division standing.*

Soc/D 158J. Religion and Ethics in China and Japan (4)
This course examines religious traditions of China and Japan. It explores the relationship between religious ideas and practices on the one hand, and issues of social and individual ethics and morality on the other. *Prerequisite: upper-division standing.*

Soc/D 169. Citizenship, Community, and Culture (4)
Will survey the liberal, communitarian, social-democratic, nationalist, feminist, post nationalist, and multicultural views on the construction of the modern citizen and good society. *Prerequisite: upper-division standing.*

Soc/D 171. Science and the Making of the Modern World (4)
This course deals with two questions and the relationships between them: How did modern scientific knowledge develop from the Scientific Revolution to the present, and how have the scientist's role and the scientific community come to have their current authority. *Prerequisite: upper-division standing.*

Soc/D 177. International Terrorism (4)
This course covers the definitions, history, and internationalization of terrorism; the interrelation of religion, politics and terror; and the representation of terrorism in the media. A number of organizations and their activities in Europe and the Middle East are examined. *Prerequisite: upper-division standing.*

Soc/D 178. The Holocaust (4)
The study of the unique and universal aspects of the Holocaust. Special attention will be paid to the nature of discrimination and racism, those aspects of modernity that make genocide possible, the relationship among the perpetrators, the victims and the bystanders, and the teaching, memory, and denial of the Holocaust. *Prerequisite: upper-division standing.*

Soc/D 179. Social Change (4)
Course focuses on the development of capitalism as a worldwide process, with emphasis on its social and political consequences. Topics include: precapitalist societies, the rise of capitalism in the West, and the social and political responses to its expansion elsewhere. *Prerequisite: upper-division standing.*

Soc/D 181. Modern Western Society (4)
This course examines the nature and dynamics of modern western society in the context of the historical process by which this type of society has emerged over the last several centuries. The aim of the course is to help students think about what kind of society they live in, what makes it the way it is, and how it shapes their lives. *Prerequisite: upper-division standing.*

Soc/D 182. Ethnicity and Indigenous Peoples in Latin America (4)
Ethnicity and the reassertion of Indian identity in contemporary Latin America. Issues related to these trends are examined in comparative perspective, with attention to changes in global conditions and in the socioeconomic, political, and cultural contexts of Latin American modernization. *Prerequisite: upper-division standing.*

Soc/D 183. Minorities and Nations (4)
We will study minority rights and aspirations as well as the logic and dynamic of nationalist movements in selected cases. We will conclude by examining the chances and challenges of a post-nationalist world. *Prerequisite: upper-division standing.*

Soc/D 185. Globalization and Social Development (4)
Social development is more than sheer economic growth. It entails improvements in the overall quality of human life, particularly in terms of access to health, education, employment, and income for the poorer sectors of the population. Course examines the impact of globalization on the prospects for attaining these goals in developing countries. *Prerequisite: upper-division standing.*

Soc/D 185XL. Foreign Language Discussion Section (1)
Students will exercise advanced foreign language skills to discuss materials in Spanish in the correspondingly numbered English language foreign area course. This section is taught by the course instructor/professor; has no final exam and does not affect grade in parent course. *Prerequisite: must be coregistered with Soc/D 185.*

Soc/D 187. African Societies through Film (4)
Exploration of contemporary African urbanization and social change via film, including 1) transitional African communities, 2) social change in Africa, 3) Western vs. African filmmakers' cultural codes. Ideological and ethnographic representations, aesthetics, social relations, and market demand for African films are analyzed. *Prerequisite: upper-division standing.*

Soc/D 187S. The Sixties (4)
A sociological examination of the era of the 1960s in America, its social and political movements, its cultural expressions, and debates over its significance, including those reflected in video documentaries. Comparisons will also be drawn with events in other countries. *Prerequisites: upper-division standing.*

Soc/D 188A. Community and Social Change in Africa (4)
The process of social change in African communities, with emphasis on changing ways of seeing the world and the effects of religion and political philosophies of social change. The methods and data used in various village and community studies in Africa will be critically examined. *Prerequisite: upper-division standing.*

Soc/D 188B. Chinese Society (4)
The social structure of the People's Republic of China since 1949, including a consideration of social organization at various levels: the economy, the policy, the community, and kinship institutions. *Prerequisite: upper-division standing.*

Soc/D 188D. Latin America: Society and Politics (4)
Course focuses on the different types of social structures and political systems in Latin America. Topics include positions in the world economy, varieties of class structure and ethnic cleavages, political regimes, mobilization and legitimacy, class alignments, reform and revolution. *Prerequisite: upper-division standing.*

Soc/D 188F. Modern Jewish Societies and Israeli Society (4)
Contradictory effects of modernization on Jewish society in Western and Eastern Europe and the plethora of Jewish responses: assimilation, fundamentalism, emigration, socialism, disapora nationalism, and Zionism. Special attention will be paid to issues of dis/continuity between Jewish societies and Israeli society. Simultaneously, we will scrutinize the influence of the Palestinian-Israeli conflict on Israeli society, state, and identity. *Prerequisite: upper-division standing.*

Soc/D 188K. American Society (4)
Comparative and historical perspectives on U.S. society. The course highlights "American exceptionalism:" did America follow a special historical path, different from comparable nations in its social relations, politics, and culture? Specific topics include class relations, race, religion, and social policy. *Prerequisite: upper-division standing.*

Soc/D 188XL. Foreign Language Discussion Section (1)
Students will exercise advanced foreign language skills to discuss materials in the correspondingly numbered English language foreign area course. *Prerequisite: must be coregistered with parent course.*

Soc/D 189. Special Topics in Comparative-Historical Sociology (4)
Readings and discussion in selected areas of comparative and historical macro-sociology. Topics may include the analysis of a particular research problem, the study of a specific society or of cross-national institutions, and the review of different theoretical perspectives. Contents will vary from year to year. *Prerequisite: upper-division standing.*

CLUSTER E: INDEPENDENT RESEARCH AND HONORS PROGRAM

Soc/E 194. Research Seminar in Washgton, D.C. (4)
(Same as PS 194, COGN 194, ERTH 194, HIST 193, USP 194.) Course attached to six-unit internship taken by students participating in the UCDC Program. Involves weekly seminar meetings with faculty and teaching assistant and a substantial research paper. *Prerequisites: department approval. Participating in UCDC Program.*

Soc/E 196A. Honors Seminar: Advanced Studies in Sociology (4)
This seminar will permit honors students to explore advanced issues in the field of sociology. It will also provide honors students the opportunity to develop a senior thesis proposal on a topic of their choice and begin preliminary work on the honors thesis under faculty supervision. *Prerequisite: acceptance into Department of Sociology Honors Program.*

Soc/E 196B. Honors Seminar: Supervised Thesis Research (4)
This seminar will provide honors candidates the opportunity to complete research on and preparation of a senior honors thesis under close faculty supervision. *Prerequisite: completion of Soc/E 196A.*

Soc/E 197. Instructional Assistance and Research in Field Methods (4)
While fulfilling apprentice-level instructional tasks as peer advisers in the Field Research Methods course (Soc/A 104), students will conduct their own research on selected issues/problems faced by field researchers. Instructional and research activities will be closely supervised by the course instructor. *Prerequisites: 3.5 in sociology, having excelled in Soc/A 104 (A or A+ grade); consent of course instructor; approval of sociology department chair.*

Soc/E 198. Directed Group Study (4)
Group study of specific topics under the direction of an interested faculty member. Enrollment will be limited to a small group of students who have developed their topic and secured appropriate approval from the departmental committee on independent and group studies. These studies are to be conducted only in areas not covered in regular sociology courses. *Prerequisites: junior standing and departmental approval required.*

Soc/E 199. Independent Study (2 or 4)
Tutorial: individual study under the direction of an interested faculty member in an area not covered by the present course offerings. Approval must be secured from the departmental committee on independent studies. *Prerequisites: junior standing and departmental approval required.*

GRADUATE

Soc/G 201A. Classical Sociological Theory I (4)
A discussion of major themes in the work of Tocqueville and Marx. *Prerequisite: graduate standing in sociology.*

Soc/G 201B. Classical Sociological Theory II (4)
A discussion of major themes in the work of Weber and Durkheim. *Prerequisite: graduate standing in sociology.*

Soc/G 202. Contemporary Sociological Theory (4)
Themes important for social theory at the turn of the twenty-first century: Marxism (Gramsci, Althusser), Critical Theory (Adorno, Habermas), Interpretation (Geertz), Social Systems (Parsons), post-structuralism (Foucault), postmodernism, and social constructivism (Bourdieu). *Prerequisite: graduate standing in sociology.*

Soc/G 203. Field Methods (4)
Research will be conducted in field settings. The primary focus will be on mastering the problems and technical skills associated with the conduct of ethnographic and participant observational studies. *Prerequisite: graduate standing in sociology.*

Soc/G 204. Text and Discourse Analysis (4)
Techniques of gathering and analyzing transcripts of naturally occurring conversations, interviews, discourse in institutional settings, public political discourse, and text of historical materials. *Prerequisite: graduate standing in sociology.*

Soc/G 205. Quantitative Methods I (4)
This course covers some of the elementary techniques used 1) to select random samples, 2) to detect statistical patterns in the sample data, and 3) to determine whether any patterns found in sample data are statistically significant. The course also stresses the benefits and drawbacks of survey and aggregate data and

some common ways in which these data are used incorrectly. *Prerequisite: graduate standing in sociology.*

Soc/G 206. Quantitative Methods II (4)
The course covers some of the more advanced techniques used 1) to select random samples, 2) to detect statistical patterns in the sample data, and 3) to determine whether any patterns found in sample data are statistically significant. The course also stresses the benefits and drawbacks of survey and aggregate data and some common ways in which these data are used incorrectly. *Prerequisite: graduate standing in sociology.*

Soc/G 207. Comparative-Historical Methods (4)
A broad-based consideration of the use of historical materials in sociological analysis, especially as this facilitates empirically oriented studies across different societies and through time. *Prerequisite: graduate standing in sociology.*

Soc/G 208. Faculty Research Seminar (2)
An introduction for entering graduate students to the range and variety of research and scholarly interest of the department's faculty. Through this introduction students will be better able to relate their own research interests and professional objectives to the ongoing work of faculty. *Prerequisite: graduate standing in sociology.* (S/U grades only.)

Soc/G 212. Social Stratification (4)
The causes and effects of social ranking in various societies. Theories of stratification; the dynamics of informal social grouping; determinants of institutional power, and the nature of struggles for power; the distribution of wealth and its causes; the dynamics of social mobility; the effects of stratification on lifestyles, culture, and deviance. *Prerequisite: graduate standing in sociology.*

Soc/G 213. Popular Culture (4)
The purpose of the course is two-fold: 1) to introduce students to a variety of theoretical perspectives on issues central to studies of popular culture, and 2) to survey disciplines outside of the field of sociology that have been contributing to the enormous intellectual growth of popular culture studies. *Prerequisite: graduate standing in sociology.*

Soc/G 216. Sociology of Culture (4)
The history of the concept of culture; cultural pluralism in advanced industrialized societies; the differentiation of cultural institutions; cultural policy and social structure; culture as a property of social groups; conflict and accommodation over efforts to change and sustain traditional culture.

Soc/G 217. Globalization, Culture, and Everyday Life (4)
This course explores the cultural, economic, and political processes which constitute globalization. Particular emphasis will be placed on understanding how consciousness and daily life practices are formed and transformed in a globalizing world. *Prerequisite: graduate standing in sociology.*

Soc/G 222. Social Movements (4)
An examination of theories accounting for the causes and consequences of social movements, including a discussion of the strengths and weaknesses of such theories for understanding historically specific revolutions, rebellions, and violent and nonviolent forms of protest in various parts of the world. *Prerequisite: graduate standing in sociology.*

Soc/G 226. Political Sociology (4)
This course discusses the relationship between state and society in a comparative perspective. The focus is on the interaction among states, domestic economic elites, and external economic and political processes in the determination of different developmental paths. Analytically, it includes topics such as characteristics and functions of the state in different types of society throughout history (with an emphasis on the varieties of capitalist and socialist state), the autonomy of the state and its causes in different settings, and developmental and predatory consequences of state activity. Readings will include both theoretical and empirical materials, the latter dealing mostly with nineteenth- and twentieth-century Europe and twentieth-century Latin America. *Prerequisite: graduate standing in sociology.*

Soc/G 227. Ethnographic Film: Media Methods (6)
Ethnographic recording of field data in written and audiovisual formats, including film, video, and CD ROM applications. Critical assessment of ethnographies and audiovisual data in terms of styles, format, and approaches. Graduate students are required to submit a fifteen-page mid-term paper comparing a written and an audiovisual ethnography and a final video ethnography with a project abstract. *Prerequisites: graduate standing/Soc/L 1A, 1B or consent of instructor.*

Soc/G 232. Advanced Issues in the Sociology of Knowledge (4)
The social construction of 'knowledge' and the social institutions in which these processes take place are examined. Topics include relationships between knowledge and social institutions, foundations of knowledge in society, knowledge and social interactions, and contrasting folk and specialized theories. *Prerequisites: graduate standing in sociology.*

Soc/G 234. Intellectual Foundation of the Study of Science, Technology, and Medicine (4)
This course focuses on some classic methodological and theoretical resources upon which the sociology of science, technology, and medicine all draw. It gives special attention to relationships between knowledge and social order, and between knowledge and practice, that are common to science, technology, and medicine. *Prerequisites: graduate standing in sociology.*

Soc/G 238. Survey of the Sociology of Scientific Knowledge (4)
An introduction to some enduring topics in the sociology of scientific knowledge and to some resources for addressing them. Attention is drawn to problems of accounting for scientific order and change, and to recurrent debates over the proper method for sociological accounts of science. *Prerequisite: graduate standing.*

Soc/G 239. Race/Ethnicity, Gender and Labor Markets (4)
Exploration and analysis of the operation of race/ethnicity and gender in the U.S. labor market. Emphasis on understanding inequality in: labor force participation, unemployment, wage inequities, and occupational locations. *Prerequisites: graduate standing in sociology.*

Soc/G 243. Sociology of Social Control (4)
An examination of the sociological literature on social control, looking at theoretical developments over time, and examining the contemporary literature dealing with social control in historical and comparative perspective. *Prerequisite: graduate standing.*

Soc/G 244. Sociology of Race and Ethnicity (4)
Analysis of enduring topics in the study of race and ethnicity, including stratification, discrimination conflict, immigration, assimilation, and politics. Other topics include racial and ethnic identity and the social construction of race and ethnic categories. A special focus is on the role of 'culture' and 'structure' for explaining race/ethnic differentiation. *Prerequisites: graduate standing in sociology.*

Soc/G 245. Graduate Seminar in Gender and Work (4)
Examination and analysis of empirical research and alternative theoretical perspectives on gender and work. Special attention to occupational segregation. Other topics include the interplay between work and family; gender, work and poverty; gender and work in the third world. Prerequisite: *graduate standing in sociology.*

Soc/G 249. Technology and the Human (4)
This course explores the ethical and political implications of technological interventions into human life. Approaches from science studies, the sociology of the body, and philosophy. Topics include transformations in domains of life such as work, health, childhood, and death.

Soc/G 252. Research Practicum I (4)
In this seminar students work on a research project, which might have originated in a paper written for another course. The goal is to produce the first draft of a paper that will be submitted to an academic journal. *Prerequisite: graduate standing in sociology.*

Soc/G 253. Research Practicum II (4)
In this seminar students revise an existing research paper (usually the one they wrote for Sociology 252) for submission to an academic journal. Emphasis is placed on conceptual development, writing style and structure, and drawing links to the existing theoretical and empirical literature. *Prerequisite: graduate standing in sociology.*

Soc/G 255A. Introduction to Science Studies (4)
(Same as Phil. 209A, HIGR 238, and COGR 225A.) Study and discussion of classic work in history of science, sociology of science, and philosophy of science, and of work that attempts to develop a unified science studies approach. Required for all students in the Science Studies Program. *Prerequisite: enrollment in Science Studies Program.*

Soc/G 255B. Seminar in Science Studies (4)
(Same as Phil. 209B, HIGR 239, and COGR 225B.) Study and discussion of selected topics in the science studies field. Required for all students in the Science Studies Program. *Prerequisite: enrollment in Science Studies Program.*

Soc/G 255C. Colloquium in Science Studies (4)
(Same as Phil. 209C, HIGR 240, and COGR 225C.) A forum for the presentation and discussion of research in progress in science studies, by graduate students, faculty, and visitors. Required of all students in the Science Studies Program. *Prerequisite: enrollment in the Science Studies Program.*

Soc/G 258. Institutional Change in the Contemporary World; Latin American Societies in a Comparative Perspective (4)
This course explores institutional change in contemporary Latin America, and compares this area with other transitional societies. Issues include social consequences of economic liberalization, changing forms of inequality, dynamics of civil society, conceptions of citizenship, quality and future of democracy. *Prerequisite: graduate standing.*

Soc/G 260. Sociology of Religion (4)
This seminar will examine major theories and debates in the sociology of religion. Possible topics include sec-

ularization, religion and immigration, and religion and politics. *Prerequisite: graduate standing in sociology.*

Soc/G 263. Graduate Seminar in the Sociology of Art (4)
This seminar explores the production and interpretation of art forms in cross-cultural context. Processes of symbolic and economic exchange in art worlds will be examined from sociological and semiotic perspectives. Contemporary and popular art forms will be analyzed as types of cultural reproduction. Graduate students will be required to submit a project abstract and final research paper of twenty-seven pages. *Prerequisite: graduate standing in sociology.*

Soc/G 264. Economic Sociology (4)
This course provides an overview of the classical and current debates in the economic sociology literature. It presents theories of the rise of industrial economics and addresses how economic activities are constituted and influenced by institutions, culture, and social structure. *Prerequisite: graduate standing in sociology.*

Soc/G 267. Sociology of Gender (4)
Course examines social construction of gender focusing on recent contributions to the field, including micro- and macro-level topics, i.e., social psychological issues in the development of gender, gender stratification in the labor force, gender and social protest, feminist methodologies. *Prerequisite: graduate standing in sociology.*

Soc/G 269. The Citizenship Debates (4)
Will examine the controversies surrounding the construction of the modern citizen and the good society of the liberal outlook, and their alternatives in the communitarian, social-democratic, nationalist, feminist, and multiculturalist perspectives. *Prerequisite: graduate standing in sociology.*

Soc/G 270. The Sociology of Education (4)
A consideration of the major theories of schooling and society, including functionalist, conflict, critical and interactional; selected topics in the sociology of education will be addressed in a given quarter, including the debate over inequality, social selection, cultural reproduction and the transition of knowledge, the cognitive and economic consequences of education. Major research methods will be discussed and critiqued. *Prerequisite: graduate standing in sociology.*

Soc/G 274. Culture and Ethnicity (4)
An in-depth analysis of the role of culture in the construction and experience of ethnicity. Topics include: culture and ethnic stratification, culture and ethnic relations, ethnic politics and policy, 'identity politics,' multiculturalism, and cross-national comparison of policy protecting ethnic cultural rights. *Prerequisite: graduate standing in sociology.*

Soc/G 284. Contemporary Biomedicine (4)
Develops central themes in medical sociology in order to understand twentieth- and twenty-first-century medical practice and research. Topics include authority and expertise; health inequalities; managed care; health activism; biomedical knowledge production; and the construction of medical objects and subjects. *Prerequisite: graduate standing.*

Soc/G 282. Immigration and Citizen (4)
Alternative theories of the relations of immigrants and host societies, and an examination on the debates on, and dynamic of, immigration expansion and restriction. Comparison of the bearing of liberal, communitarian, and ethnic citizenship discourses on the inclusion and exclusion of immigrants and their descendants. *Prerequisite: graduate standing in sociology.*

Soc/G 283. The Making of Modern Medicine (4)
An examination of the intellectual, social, cultural, and political dimensions of the Transformation of Western medicine from 1750 to 1900, with a primary focus on Anglo-American developments. *Prerequisite: graduate standing.*

Soc/G 285. Modernization and Globalization in East Asia (4)
Can East Asia modernize and globalize and still be distinct from the West? This course examines this question in multiple dimensions—political, cultural, and economic. Topics include human rights, democracy, economic organization, social institutions, and others. *Prerequisite: graduate standing.*

Soc/G 290. Graduate Seminar (4)
A research seminar in special topics of interest to available staff, provides majors and minors in sociology with research experience in close cooperation with faculty. (S/U grades permitted.) *Prerequisite: graduate standing in sociology.*

Soc/G 298. Independent Study (1-8)
Tutorial individual guides study and/or independent research in an area not covered by present course offerings. (S/U grades only.) *Prerequisite: graduate standing in sociology; departmental approval.*

Soc/G 299. Thesis Research (1-12)
Open to graduate students engaged in thesis research. (S/U grades only.) *Prerequisite: graduate standing in sociology.*

Soc/G 500. Apprentice Teaching (2-4)
Supervised teaching in lower-division contact classes, supplemented by seminar on methods in teaching sociology. (S/U grades only.) *Prerequisite: graduate standing in sociology.*

Space Science and Engineering

OFFICE: Galbraith Hall, Room 180,
Revelle College

The following are minor requirements for students admitted to UCSD January 1, 1998, and later. Students admitted to UCSD prior to the above date must see the program adviser to confirm minor requirements.

The space science and engineering minor is a focused set of seven upper-division courses open to students with junior standing in one of the following departments: MAE, chemistry, CSE, ECE, or physics. Other students with suitable chemistry, physics, and mathematics preparation may also pursue the minor.

The minor has three objectives. It is designed to offer an appropriate preparation for careers in space research and technology, with transcript notation of such a concentration of use to students. The minor can help balance strongly focussed departmental offerings with a broader interdisciplinary approach that can foster interdepartmental activities beneficial to students. Finally such a minor contributes to the preservation and renewal of the broad, interdisciplinary style which has distinguished UCSD from other leading research universities.

Curriculum

The minor consists of two required courses, Space Science (MAE 180A) and Space Engineering (MAE 180B), plus five electives to be chosen from a list of courses with the approval of an adviser. The present list of electives includes:

CHEM 170. Cosmochemistry

ECE 120. Solar System Physics

ECE 166. Microwave Systems and Circuits (extensive prerequisites, lab component)

ERTH 130. Geodynamics of Terrestrial Planets

MAE 155A-B. Aerospace Engineering Design

PHYS 160. Stellar Astrophysics

PHYS 161. Black Holes and the Milky Way Galaxy

PHYS 162. Galaxies and Cosmology

PHYS 163. Exploring the Solar Sytem

SE 144. Aerospace Structural Analysis

Spanish Literature

See Literature.

Structural Engineering

See Engineering, School of

Subject A

Web site: http://subjecta.ucsd.edu/

For information about satisfying the Subject A requirement, especially prior to enrollment, please refer to "Subject A: English Composition" in the catalog section, "Academic Regulations."

Students who have not satisfied the Subject A requirement before enrolling at UCSD must satisfy the requirement by achieving a grade of C or better in SDCC 1 (English Composition–Subject A) and by passing the Subject A Exit Examination given at the end of SDCC 1. That examination is administered by the Subject A Program office. Students must enroll in SDCC 1 (or ESL) during the first quarter of residence at UCSD. SDCC 1 is a Mesa College course taught at UCSD as part of a cooperative program with the San Diego Community College District.

Under Academic Senate regulations, SDCC 1 cannot be counted toward graduation requirements; however, the course units do count as workload credit toward the minimum progress requirement and eligibility for financial assistance.

For further information about the Subject A requirement or the Proficiency Test, please visit the Subject A Program office, 3232 Literature Building, or call (858) 534-6177.

Teacher Education Program

OFFICE: Building 517A, University Center
http://tep.ucsd.edu

Director

Randall J. Souviney

Professors

Mark I. Appelbaum, Ph.D., *Psychology*
Julian Betts, Ph.D., *Economics*
Linda Brodkey, Ph.D., *Literature*
Michael Cole, Ph.D., *Communication (University Professor)*
Grant Goodall, Ph.D., *Linguistics*
Gershon Harel, Ph.D., *Mathematics*
James D. Hollan, Ph.D., *Cognitive Science*
James Levin, Ph.D.
Hugh B. Mehan, Ph.D., *Sociology*
Carol A. Padden, Ph.D., *Communication*
Michael S. Schudson, Ph.D., *Communication*
Stefan A. Tanaka, Ph.D., *History*
Kathryn A. Woolard, Ph.D., *Anthroplogy*
Ana Celia Zentella, Ph.D., *Ethnic Studies*

Associate Professors

Gerald J. Balzano, Ph.D., *Music*
David G. Gutierrez, Ph.D., *History*
Barbara Tomlinson, Ph.D., *Literature*
Olga V. Vasquez, Ph.D., *Communication*

Assistant Professor

Gedeon O. Deák, Ph.D., *Cognitive Science*
Nora E. Gordon, Ph.D., *Economics*
Claire L. Ramsey, Ph.D.

Senior Lecturers with Security of Employment

Paula F. Levin, Ph.D., *Graduate Adviser*
Barbara Sawrey, Ph.D., *Chemistry and Biochemistry*
Randall Souviney, Ph.D., *Director of Education Studies*
Gabrielle Weinhausen, Ph.D., *Biological Sciences—Molecular Biology*

Lecturer with Security of Employment

Tom L. Humphries, Ph.D., *Associate Director, Communication*

Lecturers

Bobbie Allen, Ph.D.
Bernard (Rusty) Bresser, M.A.
Cheryl Forbes, M.A.
Christopher Halter, M.A.
Caren Holtzman, M.A.
Rachel Millstone, M.A.
Marcia Sewall, M.A.
Parick Velasquez, Ph.D.
Aurora Zepeda, M.P.A.

Distinguished Teachers in Residence

Kathy Melanese, M.A.
Campbell Naismith, M.A.

The Teacher Education Program (TEP) at UCSD offers the Master of Education Degree/California Multiple Subject Teaching Credential for elementary school teachers, the Master of Education Degree/Single Subject Credential in English, mathematics, biology, chemistry, geosciences, and physics for secondary school teachers, the Master of Arts in teaching and learning with an emphasis in curriculum design, the Master of Arts in deaf education, the Doctor of Education (Ed.D.) in Teaching and Learning, and a minor in education.

A primary focus of the Teacher Education Program is multicultural education. We require candidates to master the subject matter that they will teach and develop a repertoire of teaching practices which use their students' cultural knowledge and language as educational resources.

Admissions Process

IMPORTANT: A NEW DOCTOR OF EDUCATION (Ed.D.) IN EDUCATIONAL LEADERSHIP (jointly with San Diego State University and California State University, San Marcos) IS PENDING APPROVAL. INFORMATION REGARDING THE JOINT Ed.D. IS AVAILABLE ON THE TEP WEB SITE AT http://tep.ucsd.edu.

January 14 is the application deadine for the M.Ed./Credential programs. All applicants must apply online at http://tep.ucsd.edu

Applicants interested in financial aid should complete the FAFSA application by March 2, and may contact Graduate Student Financial Services at (858) 534-3807.

Each applicant is carefully reviewed for admission by a committee. The selection committee ensures that applicants have completed the requirements for admission described below and evaluates each applicant on the basis of the following criteria:

1. A strong interest in multicultural approaches to education; a strong desire to improve the quality of American education; a strong desire to develop self-activated learners;
2. Experience working with children in educational environments, especially with students from diverse backgrounds;
3. Participation in public service activities;
4. Academic excellence in their undergraduate and graduate studies.

More information about the entire application process is available on the TEP Web site at http://tep.ucsd.edu.

The Master of Education (M.Ed.)

The M.Ed. articulates with Multiple Subject and Single Subject credential programs. It is a rigorous 15- to 24-month professional degree program designed specifically for preservice elementary and secondary teachers earning their initial teaching credential at UCSD. This

course of study allows candidates to earn a teaching credential and the M.Ed. degree from UCSD prior to entering the teaching profession. The program requires applicants with strong subject matter preparation.

PREREQUISITE REQUIREMENTS FOR GRADUATE CREDENTIAL PROGRAMS

Master of Education/Multiple Subject (Elementary) Credential

- **UCSD Undergraduates:** Students working towards *any* major at UCSD may complete the prerequisite Multiple Subject Credential admission requirements and Educational Foundations courses while they are undergraduates.

Multiple Subject Prerequisite Requirements

1. Undergraduates completing *any* major at UCSD may complete the prerequisite requirements for the Multiple Subject Credential. Candidates prior to completing their degree. Candidates who have already received a Bachelor of Arts or Science from any University of California campus, or an appropriate equivalent degree from another institution, must apply for graduate status as a M.Ed. Multiple Subject credential student. Examples of majors not eligible for application to TEP include Business, Education, Liberal Studies, Marketing, and Recreation.

   A 3.0 cumulative GPA is required from the institution awarding the bachelor's degree.

2. Subject Matter Competence:

   This requirement is satisfied by providing evidence of satisfactory completion of the California Subject Examinations for Teachers (CSET).

3. The California Basic Educational Skills Test (CBEST):

   Evidence of passing the CBEST satisfies this requirement.

4. U.S. Constitution requirement:

This requirement is satisfied by *either:*

- Completion of a course covering the provisions and principles of the U.S. Constitution, *or*
- Passage of an appropriate exam offered through University Extension or the County Office of Education (Contact the TEP office for information.)

5. Sensitivity to second language learning:

   Applicants must demonstrate, through course work or equivalent experience, an informed sensitivity to the challenges of second language learning and acquisition. This can be fulfilled in one of three ways:

   - Completion of nine quarter units of college course work in a single language that is not the applicant's native language, *or*
   - Completion of three years of secondary school course work in a language other than English. The course work must be taken in grades 7 through 12, with at least a B average, *or*
   - Demonstration of an "equivalent experience" in a second language situation. Applicants who wish to satisfy this requirement by one of the three options listed below must submit an essay that describes the length and circumstances of the experience, including at least three specific examples of situations that helped you gain personal knowledge and appreciation of issues surrounding second language acquisition in a diverse cultural setting. The three equivalent experience options are:

     i. The applicant has lived for prolonged period of time in a country where the language spoken was not native to the applicant, and where the applicant was continuously required to speak that second language (e.g., Peace Corps).

     ii. The applicant has had an extended experience immersed in a multilingual community in his/her native country.

     iii. The applicant was raised in a multilingual community.

6. Satisfactory scores on the Graduate Record Exam (GRE) General Test

7. Prerequisites for BCLAD Emphasis in Spanish *or* American Sign Language options:

   These emphases are designed for students who have sufficient bilingual skills to effectively teach in English and either Spanish or American Sign Language. Students interested in applying for admission to the BCLAD program must demonstrate:

   a. Spanish or American Sign Language fluency:

      i. Spanish: Completion of two Spanish literature courses (Spanish/English BCLAD only), at least one of which must be upper-division in either Latin American or Chicano literature, *and* completion of the TEP Spanish Language Assessment, with an FSI score of at least 3 (scores of 3- will be accepted, but students must receive a score of 3 prior to being recommended for the BCLAD credential). Since these exams are coordinated by TEP, please contact TEP in January prior to your application to the credential program.

      ii. American Sign Language: Completion of the TEP American Sign Language assessment with a rating of "acceptable" by a panel of assessors

   b. Cultural Knowledge:

      i. Spanish: One history course *and* one culture course covering Chicano or Latin American-related topics

      ii. American Sign Language: At least one course on the language or culture of deaf people in the U.S. or intensive experience living among deaf people in the U.S.

   c. History, Politics, and Theory of Bilingual Education: TEP 125 or ETHN 140 or ETHN 144

   d. A desire to teach in a bilingual setting.

   Note: A grade of B- or higher is required for all BCLAD courses.

Educational Foundations Course-of-Study for M.Ed./Multiple Subject (Elementary) Credential Candidates

UCSD students planning to apply to the M.Ed./Multiple Subject (elementary) Credential Program must complete the *Introduction to Teaching and Learning* requirement listed in **a** below and one course from each of the remaining three areas, **b, c,** and **d** *(see Table 1 for a sample schedule).* Graduate students admitted as prerequisite candidates may satisfy the Multiple Subject prerequisite requirements as an academic year program or through an intensive summer program of defined coursework (contact TEP for admission requirements and scheduling). A minimum 3.0 GPA for all

prerequisite coursework is required for admission to the TEP credential program.

a. Introduction to Teaching and Learning. *Three* of the following courses and a corequisite practicum for each:

TEP 130. Introduction to Academic Mentoring of Elementary School Students

or

TEP 134. Introduction to Literacy and Numeracy Tutoring (recommended for Multiple Subject candidates)

and

TEP 128A-B. Introduction to Teaching and Learning (*TEP 130 [or 134] is a prerequisite for TEP 128A and cannot be taken concurrently. TEP 128A and 128B are restricted to students applying to TEP at UCSD and must be taken in the year of application to the program.)*

and

TEP 139. Practicum in Teaching/Learning *(corequisite for TEP 130 or 134 and TEP 128A-B)*

b. Learning Environments. *One* of the following courses or equivalent:

TEP 114. Cognitive Development and Interactive Computing Environments *(recommended for Multiple or Single Subject candidates)*

TEP 115. Cognitive Development and Education *(recommended for Multiple Subject candidates)*

TEP 118. Adolescent Development and Education *(recommended for Single Subject candidates)*

TEP/LING 119. First and Second Language Learning: From Childhood through Adolescence *(recommended for Single Subject candidates)*

CogSci 154. Communication Disorders in Children and Adults (same as Psy 174)

COMT 116 Practicum in Child Development (same as HDP 135/Psy 128)

HDP 1. Introduction to Human Development

Psychology 101. Introduction to Developmental Psychology

c. Language and Culture. *One* of the following courses or equivalent:

TEP/SocB 117. Language, Culture and Education *(recommended for all credential candidates)*

ANGN 117. Anthropology of Education *(recommended for all credential candidates)*

ANGN 149. Language in Society

COCU 144. Language and Society

COHI 121. Literacy, Social Organization, and the Individual

COHI 122. Communication and the Community

COHI 114. Bilingual Communication

Ethnic Studies 140. Language and American Ethnicity

Ethnic Studies 141. Language and Culture

d. School and Society. *One* of the following courses or equivalent:

TEP/SocC 126. Social Organization of Education *(recommended for credential candidates)*

TEP 125. History, Politics, and Theory of Bilingual Education *(required for BCLAD candidates)* or ETHN 140 or ETHN 144

ECON 147. Economics of Education

ANGN 112. Language, Identity, and Community

ETHN 140. Language and American Ethnicity

ETHN 144. Bilingual Communities in the U.S.A.

Table 1: Sample Course-of-Study for Multiple Subject (Elementary) Credential

FALL	WINTER	SPRING
TEP 134	TEP 128A	TEP 128B *(only S*
TEP 139	*(only W)*	*restricted to*
TEP 117*	TEP 139	*TEP candidates)*
	TEP 114/115	TEP 139
		TEP 126* or
		TEP 125 *(required for BCLAD)*

* Offered various quarters. See other options above.

Professional Preparation

After students complete the prerequisites described above, they apply to the program, as described above. Upon acceptance, teacher candidates complete the professional preparation activities which lead to the award of the Multiple Subject credential.

The professional preparation component of the Multiple Subject credential consists of five courses and fifteen weeks of student teaching in elementary school classrooms.

Additional Requirements for BCLAD Candidates

Students pursuing the BCLAD emphasis in Spanish must also take TEP 152A-B *(Bilingual Instructional Practices).* Furthermore, BCLAD candidates will be placed in bilingual student teaching situations.

A typical student schedule for the professional preparation program is shown in Table 1:

Table 1: Schedule of Professional Preparation Activities for the M.Ed./ Multiple Subject Credential

FALL	WINTER	SPRING	SUMMER
TEP 151 (4)	TEP 161B (6)	TEP 161C (4)	TEP 204 (4)
TEP 161A (6)	TEP 169A (9)	TEP 169B (9)	TEP 206 (4)
TEP 190 (4)	TEP 205A (2)	TEP 182 (4)	
TEP 201 (4)		TEP 205B (2)	
TEP 203 (4)			
TEP 250 (4)			
BCLAD candidates:			
TEP 152A (2)	TEP 152B (2)		

Master of Education/Single Subject (Secondary) Credential

- **UCSD Undergraduates:** Students working towards a *Literature, Linguistics, Mathematics, or any Science* major at UCSD may complete the prerequisite Single Subject Credential requirements while they are undergraduates.

Single Subject Prerequisite Requirements

1. Undergraduates working toward *selected* majors at UCSD may complete the prerequisite requirements for the Single Subject Credential prior to completing their degree. Students must be working toward a major in the discipline corresponding to that of the desired credential:
   - *English:* any UCSD Literature or Linguistics major, or equivalent
   - *Mathematics:* any UCSD Mathematics, Engineering, or Computer Science major, or equivalent,
   - *Biology, Chemistry, Geosciences, or Physics:* any UCSD Natural Science major, or equivalent.

Candidates who have already received a literature, linguistics, mathematics, or science Bachelor of Arts or Science degree from any University of California campus, or an appropriate equivalent degree from another institution, must apply for graduate status as a M.Ed./ Single Subject credential student.

A 3.0 cumulative GPA is required from the institution awarding the bachelor's degree.

2. Subject Matter Competence:

   This requirement is satisfied by *either:*

   - providing evidence of satisfactory completion of the appropriate sections of the California Subject Examinations for Teachers (CSET)
     or
   - having completed all of the subject matter preparation program for the desired single subject credential.

3. The California Basic Educational Skills Test (CBEST):

   Evidence of passing the CBEST satisfies this requirement.

4. U.S. Constitution requirement:

   - completion of a course covering the provisions and principles of the U.S. Constitution
     or
   - passage of an appropriate exam offered through University Extension or the County Office of Education (Contact the TEP office for information.)

5. Sensitivity to second language learning:

   Applicants must demonstrate, through course work or equivalent experience, an informed sensitivity to the challenges of second language learning and acquisition. This can be fulfilled in one of three ways:

   - completion of nine quarter units of college course work in a single language that is not the applicant's native language
     or
   - completion of three years of secondary school course work in a language other than English. The course work must be taken in grades 7 through 12, with at least a B average
     or
   - demonstration of an "equivalent experience" in a second language situation.

Applicants who wish to satisfy this requirement by one of the three options listed below must submit an essay that describes the length and circumstances of the experience, including at least three specific examples of situations that helped you gain personal knowledge and appreciation of issues surrounding second language acquisition in a diverse cultural setting. The three equivalent experience options are:

i. The applicant has lived for a prolonged period of time in a country where the language spoken was not native to the applicant, and where the applicant was continuously required to speak that second language (e.g., Peace Corps).

ii. The applicant has had an extended experience immersed in a multilingual community in his/her native country.

iii. The applicant was raised in a multilingual community.

6. Satifactory scores on the Graduate Record Exam (GRE) General Test.

7. Prerequisites for BCLAD Emphasis in Spanish:

   This emphasis is designed for students who have sufficient bilingual skills to effectively teach in English and Spanish. Students interested in applying for admission to the BCLAD program must demonstrate:

   a. Spanish Language Fluency:

   i. Completion of two Spanish literature courses, at least one of which must be upper-division in either Latin American or Chicano literature, and

   ii. Completion of the TEP Spanish Assessment, with an FSI score of at least 3 (Scores of 3- will be accepted, but student must receive a score of 3 prior to being recommended for the BCLAD credential.) Since these exams are coordinated by TEP, please contact TEP in January prior to application to the credential program.

   b. Cultural Knowledge: One history course *and* one culture course covering Chicano or Latin American-related topics.

   c. History, Politics, and Theory of Bilingual Education: TEP 125 or ETHN 140 or ETHN 144

   d. A desire to teach in a bilingual setting.

   Note: *A grade of B– or higher is required for all BCLAD courses.*

Educational Foundations Course-of-Study for M.Ed./Single Subject (Secondary) Credential Candidates

UCSD students planning to apply to the M.Ed./ Single Subject (secondary) Credential Program must complete the *Introduction to Teaching and Learning* requirement listed in **a** below and one course from each of the remaining three areas, **b**, **c**, and **d** *(see Table 2 for a sample schedule).* A minimum 3.0 GPA for all prerequisite coursework is required for admission to the TEP credential program.

a. Introduction to Teaching and Learning. *Three* of the following courses and a corequisite practicum for each:

   TEP 129 A-B-C. Introduction to Teaching and Learning *(TEP 129B and 129C are restricted to students applying to TEP at UCSD and must be taken in the year of application to the program.)*

   or

   TEP 136. Introduction to Academic Tutoring of Secondary School Students or TEP 138. Introduction to Academic Tutoring at the Preuss School *(may be substituted for TEP 129A only)*

   and

   TEP 139. Practicum in Teaching/Learning *(corequisite for TEP 129 A-B-C and TEP 136)*

   and

   TEP 190. Research Practicum *(take concurrently with TEP 129C)*

b. Learning Environments. *One* of the following courses or equivalent:

   TEP 114. Cognitive Development and Interactive Computing Environments *(recommended for Multiple or Single Subject candidates)*

   TEP 115. Cognitive Development and Education *(recommended for Multiple Subject candidates)*

   TEP 118. Adolescent Development and Education *(recommended for Single Subject candidates)*

   TEP/LING 119. First and Second Language Learning: From Childhood through

Adolescence *(recommended for Single Subject candidates)*

CogSci 154. Communication Disorders in Children and Adults (same as Psy 174)

COMT 116. Practicum in Child Development (same as HDP 135/Psy 128)

HDP 1. Introduction to Human Development

Psychology 101. Introduction to Developmental Psychology

c. Language and Culture. *One* of the following courses or equivalent:

TEP/SocB 117. Language, Culture and Education *(recommended for credential candidates)*

ANGN 117. Anthropology of Education

ANGN 149. Language in Society

COCU 144. Language and Society

COHI 121. Literacy, Social Organization, and the Individual

COHI 122. Communication and the Community

COHI 114. Bilingual Communication

Ethnic Studies 140. Language and American Ethnicity

Ethnic Studies 141. Language and Culture

d. School and Society. *One* of the following courses or equivalent:

TEP/SocC 126. Social Organization of Education *(recommended for credential candidates)*

TEP 125. History, Politics, and Theory of Bilingual Education *(required for BCLAD candidates)* or ETHN 140 or ETHN 144

ECON 147. Economics of Education

ANGN 112. Language, Identity, and Community

ETHN 140. Language and American Ethnicity

ETHN 144. Bilingual Communities in the U.S.A.

Table 2: Sample Course-of-Study for Single Subject (Secondary) Credential

FALL	WINTER	SPRING
TEP 129A *(only F)*	TEP 129B *(only W)*	TEP 129C *(only S restricted to TEP candidates)*
TEP 139	TEP 139	TEP 139
TEP 117*	TEP 114/118/119	TEP 126* or TEP 125 *(required for BCLAD)*
		TEP 190 *(concurrent with TEP 129C)*

*Offered various quarters. See options above.

Internship and Student Teaching Programs

Those admitted to the M.Ed./Single Subject Credential Program are eligible to be interviewed in June, July, and August for a paid internship for the following school year, in a local middle or high school. Availability of internship positions in **not** guaranteed, though TEP attempts to facilitate internship positions for all Single Subject students. Students who do not receive an internship position will do their practicum as student teachers instead. Interns are responsible for teaching English, mathematics, biology, chemistry, geosciences, or physics courses under the guidance of a TEP supervisor and an on-site adviser. Interns, who are generally hired for part-time teaching loads, receive a salary from the school district commensurate with the number of courses they teach.

Professional Preparation Courses

Once students are selected, they are provided an intensive program of professional preparation, including a full-time summer program of teaching methods courses and seminars offered throughout the academic year which address classroom management techniques and strategies for dealing with concrete teaching and learning situations.

A typical student schedule for the Single Subject Professional Preparation Program is shown in Table 2.

Table 2: The Professional Preparation Program for the M.Ed./Single Subject Credential

SUMMER (1)	FALL	WINTER	SPRING
TEP 173 (4) (or 174 or 175)	TEP 179A (8)	TEP 179B (8)	TEP 179C (8)
TEP 176 (4)	TEP 151 (4)	TEP 181 (4)	TEP 182 (4)
TEP 201 (4)		TEP 205A (2)	TEP 205B (2)
TEP 203 (4)			
TEP 250 (4)			

For BCLAD Candidates:
TEP 152B (2) TEP 152A (2)

SUMMER (2)

TEP 204 (4)
TEP 206 (4)

Minor in Teacher Education

UCSD undergraduate students who are interested in pursuing a teaching credential should refer to the appropriate elementary or secondary Educational Foundations course of study when selecting courses for the minor. Contact TEP for details.

The Teacher Education Program offers a Minor in Teacher Education that requires a minimum of twenty-eight units, twenty units of which must be upper division. All courses for the minor must be taken for a letter grade except TEP 139. Students must complete a course-of-study that includes a minimum of one course in category **a** below and a minimum of one course from two of the remaining three categories **b, c, or d**. The TEP minor requires a minimum of twelve units in TEP courses. A maximum of eight units of practicum (TEP 139) may be applied to the minor.

a. Introduction to Teaching and Learning

One of the following courses (four quarter units) and corequisite practicum TEP 139 (two quarter units)

TEP 128 A-B. Introduction to Teaching and Learning (Elementary). (TEP 130 [or 134] is a prerequisite for TEP 128A and cannot be taken concurrently. TEP 128A and 128B are restricted to students applying to TEP at UCSD and must be taken in the year of application to the program.)

TEP 129 A-B-C Introduction to Teaching and Learning (Secondary) (It is preferable that 129A be taken in the fall quarter of senior year. TEP 129B and 129C are restricted to students applying to TEP at UCSD and must be taken in the year of application to the program.)

TEP 130. Introduction to Academic Mentoring of Elementary School Students

TEP 134. Introduction to Literacy and Numeracy Tutoring *(recommended for Multiple Subject candidates)*

TEP 136. Introduction to Academic Tutoring of Secondary School Students

TEP 138. Introduction to Academic Tutoring of Preuss School Students

and

TEP 139. Practicum in Teaching/Learning

b. Learning Environments

TEP 114. Cognitive Development and Interactive Computing Environments *(recommended for Multiple or Single Subject candidates)*

TEP 115. Cognitive Development and Education *(recommended for Multiple Subject candidates)*

TEP 118. Adolescent Development and Education *(recommended for Single Subject candidates)*

TEP 119. First and Second Language Learning: From Childhood through Adolescence *(recommended for Single Subject candidates)*

Cog Sci 154. Communication Disorders in Children and Adults (same as Psychology 174)

COMT 116. Practicum in Child Development (same as HDP 135/Psychology 128)

HDP 1. Introduction to Human Development

Psychology 101. Introduction to Developmental Psychology

c. Language and Culture

TEP/SocB 117. Language, Culture and Education *(recommended for all TEP credential candidates)*

ANGN 117. Anthropology of Education

ANGN 149. Language in Society

COCU 144. Language and Society

COHI 121. Literacy, Social Organization, and the Individual

COHI 122. Communication and the Community

COHI 114. Bilingual Communication

Ethnic Studies 140. Language and American Ethnicity

Ethnic Studies 141. Language and Culture

d. School and Society

TEP/Soc 126. Social Organization of Education *(recommended for all TEP credential candidates)*

TEP 125. History, Politics, and Theory of Bilingual Education *(required for BCLAD and recommended for all TEP credential candidates)* or ETHN 140 or ETHN 144

ECON 147. Economics of Education

ANGN 112. Language, Identity, and Community

ETHN 140. Language and American Ethnicity

ETHN 144. Bilingual Communities in the U.S.A.

The Master of Arts in Teaching and Learning: Curriculum Design

The M.A. in teaching and learning at UCSD offers professional educators in elementary and secondary schools an extensive overview of principles of educational research and curriculum design.

A key feature of the M.A. program is the integration of research and practice. M.A. students remain full-time K–12 teachers for the duration of the program. They design, implement, and evaluate curricular innovations in their own classrooms. The culmination of the M.A. work is a thesis describing the rationale, development, and effectiveness of these innovations.

Examples of M.A. Research Projects

The topics of the M.A. theses in past years are varied, and have included: multimedia approaches to secondary biology and chemistry instruction; writing revision among emergent writers; building partnerships between families and schools; activities which link home and school experiences in the content areas of reading and writing, mathematics, science, and social studies; improved integration of curriculum and assessment; motivation and art; using technology for mathematics and geography teaching; and embedding ESL in native language instruction.

Since the program's inception in 1988, 173 students have earned M.A. degrees in teaching and learning with an emphasis in curriculum design. Of these, ninety-four came from the ranks of elementary teachers, seventy-three worked as secondary teachers, and six taught at the post-secondary level.

The M.A. Course of Study (Teaching and Learning: Emphasis in Curriculum Design)

The M.A. program requirements consist of forty quarter units of course work, including the master's thesis. Courses are usually offered for 4.0 quarter units of credit, and are typically offered one night per week, from 5:00–8:00 p.m. Core course work comprises twenty-eight units, with the remaining twelve units consisting of elective course work.

A typical program consists of:

CORE M.A. COURSE WORK

First Summer
(mid June–late August)

TEP 231 or 232 (offered alternating summers)

Each summer includes an intensive course in innovative instructional theory and practices. Specific topic changes each year. Examples include: portfolio and authentic assessment; telecommunications in the classroom; collaborative learning; and research on child development and learning.

TEP 229

Introductory course about research on teaching practice.

Fall, Winter, and Spring:

TEP 230A-B-C

Three quarter seminar providing an extensive overview of curriculum design principles, and application of educational research to classroom practice.

TEP 233A

Graduate seminar series in which UCSD faculty present their research on educational topics.

TEP 290

Intensive work with faculty adviser (Spring only)

Second Summer
(mid June–late August)

TEP 231 or 232 (see above)

TEP 295

Completion of M.A. thesis writing.

Admission to the M.A. program in teaching and learning at UCSD is competitive. Factors considered by the selection committee include:

- teaching experience
- professional development activities
- experience and interest in curriculum design
- academic record

Admission to graduate standing at UCSD requires a minimum cumulative GPA of 3.0 for any prior graduate work, and for the bachelor's degree. Official scores from the GRE verbal, analytic, and quantitative sections are also required. Application deadline is February 1.

The Master of Arts in Teaching and Learning: Bilingual Education (ASL-English)

The Teacher Education Program (TEP) at UCSD offers a master of arts in teaching and learning: bilingual education emphasis (ASB-English) and the California Deaf and Hard-of-Hearing Specialist Teaching Credential and the Multiple Subject Teaching Credential with BCLAD emphasis for elementary school teachers. This program of study includes extensive practicum experience combined with the latest research and innovation in bilingual education and deaf education. Students in the program participate in research and development on the leading edge of bilingual, multicultural education for deaf and hard-of-hearing children.

In keeping with its aim of training teachers who will be able to meet the needs of deaf and hard-of-hearing children from various language and cultural backgrounds, TEP requires fluency in ASL for acceptance into the program. TEP's teacher training program is designed to prepare teachers to work in various types of school settings from residential school classrooms to local public school classrooms for deaf and hard-of-hearing children. TEP recognizes that deaf and hard-of-hearing children need teachers who are themselves bilingual and knowledgeable about the role of culture in human development.

Prerequisite Course of Study Education Foundations Sequence

Prior to admittance to the credential and master's study, prerequisite students (or UCSD undergraduates pursuing the minor in teacher education) complete the following five courses offered during the first summer.

TEP 128A-B: Introduction to Teaching and Learning (Elementary)

TEP 115: Cognitive Development and Education

TEP 117: Language, Culture and Education

TEP 125: History, Politics, and Theory of Bilingual Education

Program of Study for the Deaf and Hard-of-Hearing Specialist Credential, the Multiple Subject Teaching Credential with BCLAD Emphasis and the Master of Arts in Teaching and Learning.

After completion of the prerequisite component, students complete a program of study resulting in the California Deaf and Hard-of-Hearing Specialist Credential at the elementary level. Students also qualify for the Multiple Subject (BCLAD) credential.

This program of study consists of courses in bilingual education theory, methods, and applications to deaf education in addition to intensive classroom practice. During the second year of study the focus is on designing, implementing and evaluating a research project. This integration of research and practice is central to the goal of the M.A. program to develop teachers as researchers.

A typical program of study includes:

YEAR 1

Fall

COHI 124/TEP151 (alternating): Voice: Deaf People in America/Teaching the English Language Learner

TEP 142A: ASL-English Bilingual Education Practices

TEP 161A: Innovative Instructional Practices

TEP 190: Research Practicum (four units)

TEP 203: Technology, Teaching, and Learning

TEP 201: Introduction to Resources for Teaching and Learning

TEP 250: Equitable Educational Research and Practice

Winter

TEP 142B: ASL-English Bilingual Education Practices

TEP 161B: Innovative Instructional Practices

TEP 169A: Practicum in Student Teaching

Spring

TEP 142C: ASL-English Bilingual Education Practices

TEP 161C: Innovative Instructional Practices

TEP 169B: Practicum in Student Teaching

TEP 182: Inclusive Educational Practices

YEAR 2

Fall

COHI 124/TEP 151 (alternating): Voice: Deaf People in America/Teaching the English Language Learner

TEP 240A: Research in ASL-English Bilingual Education

TEP 241: Advanced Topics in Deaf Education

Winter

TEP 233A: Topics in Education Research and Design

TEP 240B: Research in ASL-English Bilingual Education

TEP 290: Research Practicum

Spring

TEP 149: Education Specialist Student Teaching

TEP 240C: Research in ASL-English Bilingual Education

Summer

TEP 295: M.A. Thesis

Admission Requirements

Candidates will apply to graduate admission to the prerequisite component of this program. Upon satisfactory completion of the prerequisite component, students will advance to the professional component and master's component which require two years of study. The following are the minimum eligibility requirements to for admission to the graduate prerequisite component. Applications are available beginning in January. **Application deadline is February 1.**

- A bachelor's degree with a 3.0 cumulative GPA
- Official Graduate Record Exam (GRE) scores
- Subject matter competence (CSET)
- The California Basic Educational Skills Test (CBEST)
- Completion of a course including the provisions and principles of the U.S. Constitution, **or** passage of the appropriate exam
- Official Graduate Application and Fee
- Statement of Purpose and Reference Letters
- Fluency in American Sign Language
- Knowledge and experience of the social and cultural life of deaf people
- A desire to teach deaf children of varying language and cultural backgrounds

Admission to graduate standing at UCSD requires a minimum cumulative GPA of 3.0 for any prior graduate work, and for the bachelor's degree. Official scores from the GRE verbal, analytic, and quantitative sections are also required.

Doctor of Education (Ed.D.) in Teaching and Learning

The Teacher Education Program at UCSD offers a Doctor of Education (Ed.D.) degree in Teaching and Learning. This cohort-based four-year doctorate is designed to enable professional educators to participate in a research-based program while working in an educational setting. The Ed.D. course of study provides a research perspective on educational reform, with the expectation of developing regional leadership for K–12 and postsecondary teaching and learning. With its rich tradition of research and technological innovation, UCSD is uniquely positioned in the region to provide the research expertise for this Ed.D. program.

The Doctor of Education in Teaching and Learning program provides professional educators with the knowledge and skills to serve as faculty of pre-service teacher education and leaders of professional development for practicing teachers. Students take courses which address the topics of school reform and educational equity; learning and educational technology; curriculum research and theory; qualitative and quantitative research methods; cognition and learning theory; the social organization of schooling; language and culture; and research on teaching and learning. The application deadline is February 1.

The following is a typical course of study:

YEAR 1

Summer

TEP 229: Introduction to Educational Resources

TEP 231 or TEP 232
(offered alternating summers)

Fall

TEP 230A: Research in Curriculum Design

Winter

TEP 230B: Research in Curriculum Design

Spring

TEP 230C: Research in Curriculum Design

Summer

TEP 295: M.A. Thesis

TEP 231 or TEP 232
(offered alternating summers)

YEAR 2

Fall

TEP 260A: Educational Research and Evaluation Design

TEP 270: Leadership and Equity in Educational Reform

Winter

TEP 260B: Educational Research and Evaluation Design

Elective Graduate Seminar

Spring

TEP 260C: Educational Research and Evaluation Design

Elective Graduate Seminar

YEAR 3

Fall

TEP 261A: Advanced Research and Evaluation Methods

Elective Graduate Seminar

Winter

TEP 261B: Advanced Research and Evaluation Methods

Elective Graduate Seminar

Spring

TEP 261C: Advanced Research and Evaluation Methods

Elective Graduate Seminar

YEAR 4

Fall

TEP 262A: Dissertation Writing Seminar

TEP 299: Dissertation Research

Winter

TEP 262B: Dissertation Writing Seminar

TEP 299: Dissertation Research

Spring

TEP 262C: Dissertation Writing Seminar

TEP 299: Dissertation Research

COURSES

The following courses are offered by the TEP faculty. Students are advised to consult with a TEP adviser to determine which courses satisfy credential requirements. Undergraduate students may enroll in graduate seminars with the consent of instructor.

UPPER-DIVISION

COHI 124. Voice: Deaf People in America (4)
The relationship between small groups and dominant culture is studied by exploring the world of deaf people who have for the past twenty years begun to speak as a cultural group. Issues of language, communication, self-representation, and social structure are examined. *Prerequisite: Com/HIP 100 or consent of the instructor.*

TEP 105. Teaching and Learning Physics (4)
(Same as PHYS 180.) A course on how people learn and understand key concepts in Newtonian mechanics. Reading in physics and cognitive science plus fieldwork teaching and evaluating K–12 students. Useful for students interested in teaching. *Prerequisite: Phys. 1A, 2A, or 4A or consent of the instructor.*

TEP 109. Teaching Physical Education (4)
This course is designed to assist future elementary teachers and recreation fitness leaders develop quality physical education programs for children. Instruction focuses on theory and practice of movement activities that are physically and emotionally safe, health promoting, and developmentally appropriate. (S)

TEP 114. Cognitive Development and Interactive Computing Environments (4)
Learning and development considered as an evolving interplay between "internal representations" and "external representations" of the world, with special attention devoted to the design, history, and educational implications of computer-based tools and learning environments. *Prerequisite: TEP 180 or consent of instructor.* (W)

TEP 115. Cognitive Development and Education (4)
This course examines the development of thinking and language in preschool and elementary school children, with implications for education. Themes include facilitating children's learning, and individual differences in cognition. Examples of topics covered are word learning, mathematical knowledge, and scientific thinking. Letter grade only. (W)

TEP 116. The Psychology of Teaching and Structures of Information for Human Learning (0-4)
College students tutoring college students. Curriculum: basic applied learning principles, specifying objectives, planning and designing instruction, testing, evaluation, interpersonal communication skills, study skills. Objectives will be assessed by project completion and practicum feedback. This course is not creditable toward professional preparation requirements for the multiple subject credential. Prerequisite: departmental approval (consent of instructor)—department stamp restriction. (F,W,S)

TEP 117. Language, Culture, and Education (4)
(Same as Soc/B 117) The mutual influence of language, culture, and education. Explanations of stu-

dents' school success and failure that employ linguistic and cultural variables, bilingualism, and cultural transmission through education are explored. (F,W,Su)

TEP 118. Adolescent Development and Education (4)
This course introduces prospective secondary teachers to the cognitive, social, and emotional development of adolescents, including developmental learning theory, the teaching/learning process, effective learning environments, and cross-cultural variation in development. Implications for classroom practice are drawn. (W)

TEP/LING 119. First and Second Language Learning: From Childhood through Adolescence (4)
An examination of how human language learning ability develops and changes over the first two decades of life, including discussion of factors that may affect this ability. *Prerequisite: upper-division standing or consent of instructor.*

TEP 125. History, Politics, and Theory of Bilingual Education (4)
This course provides a historical overview and models of bilingual education in the United States. Students will examine sociocultural, theoretical, and policy issues associated with native language and second-language instruction, and legal requirements for public bilingual program.

TEP 126. Social Organization of Education (4)
(Same as Soc/C 126) The social organization of education in the U. S.. and other societies; the functions of education for individuals and society; the structure of schools; educational decision-making; educational testing; socialization and education; formal and informal education; cultural transmission. (S,Su)

TEP 127A-B-C. Practicum in Interactive Computing (4-4-4)
The course focuses on interactional computing in teaching/learning. Course work concentrates on interactive computing, application to teaching, learning, bilingualism, and communication. Concurrent with course work, students are assigned to a school or community field site implementing interactive computing. Students will write research reports integrating course work and field experience. (F,W,S)

TEP 128 A-B. Introduction to Teaching and Learning (Elementary) (4-4)
This course series is for undergraduates who are exploring a career in elementary school teaching. Topics addressed include: theories of teaching and learning; research on cognition and motivation; and the cultural context of classroom teaching and learning. TEP 128A focuses on the learner in the teaching-learning interaction and TEP 128B focuses on the teacher in the teaching-learning interaction. *Prerequisites: department stamp required; TEP 139 must be taken as corequisite. TEP 130 or 134 must be completed before TEP 128A, and 128A for 128B. TEP 128A and TEP 128B are restricted for students applying to the TEP M.Ed/Multiple Subject Credential Program.*

TEP 129 A-B-C. Introduction to Teaching and Learning (Secondary) (4-4-4)
This course series is for undergraduates who are exploring a career in teaching secondary school. Topics addressed include: theories of teaching and learning processes and motivation for science, mathematics, and English instruction. TEP 129A focuses on the analysis of the needs of individual learners and small group instruction techniques; TEP 129B emphasizes the various roles of the classroom teacher and planning individual lessons; and TEP 129C emphasizes the assessment of student work and longer-range curriculum planning. *Prerequisites: department stamp. TEP 139 must be taken as corequisite. Must have successfully completed TEP 136, 138, or 129A for 129B, and 129B for 129C. TEP 129B and 129C are restricted for students applying to the TEP M.Ed./Single Subject Credential Program.*

TEP 130. Introduction to Academic Mentoring of Elementary/School Students (4)
This course focuses on the role of undergraduate mentors in raising academic expectations for students and families traditionally underrepresented at the university. The relationship between the school and community, the social and political organization of elementary schools, and the academic achievement of elementary children are examined. *Prerequisites: department stamp required. TEP 139 must be taken as a corequisite.*

TEP 134. Introduction to Literacy and Numeracy Tutoring (4)
This course examines effective practices for language arts and mathematics learning for elementary school children. The field experience and seminar focus on the tutor/student relationship, teaching and learning processes for literacy and numeracy, and community service. *Prerequisites: department stamp required. TEP 139 must be taken as a corequisite.*

TEP 136. Introduction to Academic Tutoring of Secondary School Students (4)
This course focuses on the role of undergraduate tutors in building academic resiliency in secondary students traditionally underrepresented at the university. The relationship between the school and community, the social and political organization of secondary schools, the philosophical, sociological, and political issues which relate to the U.S. secondary educational system, and the academic achievement of secondary children are examined. *Prerequisites: department stamp required. TEP 139 must* be *taken as a corequisite.*

TEP 138. Introduction to Academic Tutoring at the Preuss School (4)
This course focuses on effects of the Charter School movement on public education in the U.S., the role of the research universities in K-12 education, the social and political organization of the schools, the philosophical, sociological, and political issues which relate to the U.S. secondary educational system, and the academic achievement of secondary children. Students investigate the role of undergraduate tutors in building academic resiliency in secondary students traditionally underrepresented at the university. *Prerequisites: department stamp required. TEP 139 must be taken as a corequisite.*

TEP 139. Practicum in Teaching/Learning (2)
Students are placed in local schools and work with students in classrooms and the community. Students work on educational activities with K–12 students a minimum of four hours/week. *Prequisites: department stamp required. One of the following courses (may be taken concurrently) TEP 109, or TEP 127A-B-C, or TEP 128A-B, or 129A-B-C, or 130, or 134, or 136, or 138.*

TEP 142A. ASL-English Bilingual Education Practices (4)
Students will examine the history, current theory, philosophy, legislation, and trends in deaf education. Methods of first- and second-language development, communication, and literacy skills for deaf and hard-of-hearing children will be introduced. *Prerequisites: TEP 115, TEP 117, TEP 126, TEP 128A, TEP 128B. Must be a TE81 major.* (F)

TEP 142B. ASL-English Bilingual Education Practices (2)
Students will investigate formal and informal assessment techniques used for deaf and hard-of-hearing children, bilingual/multicultural education practices across the curriculum, effective learning environments and approaches for educating and interacting with families and communities. *Prerequisites: TEP 142A, TEP 161A. Must be a TE81 major.* (W)

TEP 142C. ASL-English Bilingual Education Practices (2)
Students will continue to investigate formal and informal assessment techniques used for deaf and hard of hearing children, bilingual/multicultural education practices across the curriculum, effective learning environments and approaches for educating and interacting with families and communities. *Prerequisites: TEP 142A, TEP 142B, TEP 161A. Must be a TE81 major.*

TEP 149. Deaf Education Specialist Student Teaching Practicum (9)
Education specialist credential candidate performs student teaching in participating schools for a minimum of seven weeks full-time under the supervision of a cooperating teacher and university supervisor. The field experience provides professional preparation and diversified teaching responsibilities for post-baccalaureate students pursuing the California Deaf and Hard of Hearing Specialist and BCLAD Credential. *Prerequisites: must be a TE81 major only—an affirmed Multiple Subject candidate at UCSD who has advanced to student teaching.*

TEP 151. Teaching the English Language Learner (4)
Students will examine the principles of second language acquisition and approaches to bilingual education. They will develop a repertoire of strategies for teaching in elementary or secondary content areas. *Prerequisite: TE81 or TE85 major code.* (F)

TEP 152A. Bilingual Instructional Practices (2)
History and models of bilingual education; socio-cultural issues associated with second language instruction, legal requirements for public school bilingual programs, native language and ESL teaching methods. First course in a two course sequence. *Prerequisite: TE85 major code.* (F)

TEP 152B. Bilingual Instructional Practices (2)
History and models of bilingual education; socio-cultural issues associated with second language instruction, legal requirements for public school bilingual programs, native language and ESL teaching methods. *Prerequisite: TE85 major code.* (Su,W)

TEP 161A. Innovative Instructional Practices (6)
First course in a three course sequence. It provides pedagogical methods for multiple subject teaching. Diverse subject areas (math, science, fine arts, P.E., and social studies) are integrated into a single intercurricular course of study by emphasizing activity/inquiry techniques of instruction. *Prerequisite: must be a TE81 or TE85 major.* (F)

TEP 161B. Innovative Instructional Practices (6)
Second course in three course sequence. It provides pedagogical methods for multiple subject teaching. Diverse subject areas (language arts, English language development, health education, mathematics, sciences, social studies, fine arts, and physical education) are integrated into a single intercurricular course of study

by emphasizing activity/inquiry techniques of instructions. *Prerequisities: TEP 161A; TE81 or TE85 major.*

TEP 161C. Innovative Instructional Practices (4)
Last course in a three course sequence. It provides pedagogical methods for multiple subject teaching. General teaching methods are integrated into a single intercurricular course of study by emphasizing activity/inquiry techniques of instruction. *Prerequisites: TEP 161B, must be a TE81 or TE85 major.* (S)

TEP 169 A-B. Multiple Subject (Elementary) Student Teaching Practicum (9-9)
The elementary credential candidate performs student teaching in participating schools for seven to eight weeks full-time for each course (fifteen weeks total) under the supervision of a cooperating teacher and university supervisor. The student teaching experience offers professional preparation and diversified teaching responsibilities for post-baccalaureate students pursuing the California Multiple Subject Teaching Credential. *Prerequisites: TE81 or TE85 major. Affirmed Multiple Subject Credential candidate at UCSD who has advanced to student teaching.*

TEP 173. Secondary English Teaching Practices (4)
The course introduces prospective secondary teachers to principles and strategies of teaching English language arts. Topics include: writing processes, reading processes, integrated language arts, assessment, the second language learner, the classroom community, the California English Language Arts Framework. *Prerequisite: TE85 major code or consent of instructor.* (Su)

TEP 174. Secondary Mathematics Teaching Practices (4)
Mathematics teaching techniques including, curriculum design, California Model Curriculum Standards, instructional methods, computer applications, selection and use of textbooks, student assessment, lesson planning, and classroom organization. Professional matters including curriculum planning, professional organizations, para-professionals, professional ethics, education law, and parent involvement are addressed. *Prerequisite: TE85 major code or affirmed credential candidate or approval of instructor.* (Su)

TEP 175. Secondary Science Teaching Practices (4)
Science teaching techniques, including science curriculum design, California Model Curriculum Standards, instructional methods, computer applications, selection and use of textbooks, student assessment, lesson planning, and classroom organization. Professional matters including curriculum planning, professional organizations, para-professionals, professional ethics, education law, and parent involvement are addressed. *Prerequisite: TE85 major or approval of instructor.* (Su)

TEP 176. Language and Learning Instruction (4)
This course satisfies the California Commission on Teacher Credentialing requirement for preparation in reading theory and methods for all credential candidates. Theories of reading development, integration of the language arts, reading and writing in the content areas, teaching methods, and literature. *Prerequisite: TE85 major code.* (Su)

TEP 179 A-B-C. Single Subject (Secondary) Internship Practicum (8-8-8)
The secondary credential candidate teaches approximately one academic quarter for each course in this series (one public school academic year) under the guidance of a university supervisor with additional support provided by an on-site teacher. The internship offers extensive professional preparation and diversified teaching experience under actual classroom conditions for post-baccalaureate students pursuing the California Single Subject Teaching Credential. *Prerequisites: TE85 major. Affirmed Single Subject internship credential candidate at UCSD.*

TEP 181. Health Education (4)
This course satisfies the Commission on Teacher Credentialing requirement for Health Education. Topics include: physical education, substance abuse, sex education, cardio-pulmonary resuscitation, nutrition, and first aid. *Prerequisite: TE81 or TE85 major code.* (F,Su)

TEP 182. Inclusive Educational Practices (4)
This course satisfies the Commission on Teacher Credentialing requirement for Special Education. Topics include: teaching methods for accommodating special-needs students in the regular classroom, developing an Individual Education Plan, characteristics of special-needs students, lesson planning to accommodate individual differences, and legislated mandates. *Prerequisite: TE81 or TE85 major code.* (S)

TEP 183. Current Issues in Teaching and Learning (4)
This course addresses curricula and teaching practices in the K–12 schools. Specific course topics will be developed in cooperation with local school faculty working with TEP on preservice, staff development, and research activities. General issues will include second language acquisition, uses of technology in schools, language arts, mathematics and science instruction, integrated curriculum, and alternative assessment. *Prerequisite: TE79 or TE80 major code.* (Su) (not offered 2002–2003).

TEP 190. Research Practicum (1-6)
Supervised research studies with individual topics selected according to students' special interests. Students will develop a research proposal and begin to gather and analyze data. *Prerequisite: consent of instructor.* (F,W,S)

TEP 195. Apprentice Teaching (2-4)
Advanced TEP students are prepared in effective methods of supervising the preparation of UCSD students serving as paraprofessionals in K-12 classrooms. Topics covered include: classroom management, interpersonal relations, supervision techniques, multi-cultural and multi-lingual education, politics in the school, and curriculum development. Each student serves as a discussion leader and conducts at least two workshops. *Prerequisites: department stamp required and TE79 or TE80 major code.*

TEP 198. Directed Group Study (4-2)
Directed group study, guided reading, and study involving research and analysis of activities and services in multicultural education, bilingual education, the teaching-learning process, and other areas that are not covered by the present curriculum. *Prerequisite: consent of instructor.*

TEP 199. Special Studies (4)
Individual guided reading and study involving research and analysis of activities and services in multicultural education, bilingual education, the teaching-learning process, and other areas that are not covered by the present curriculum. *Prerequisite: consent of instructor.*

GRADUATE

Sociology 270. The Sociology of Education (4)
A consideration of the major theories of schooling and society, including functionalist, conflict, critical, and interactional; selected topics in the sociology of education will be addressed in a given quarter, including: the debate over inequality, social selection, cultural reproduction and the transition of knowledge, the cognitive and economic consequences of education. Major research methods will be discussed and critiqued.

TEP 201. Introduction to Resources for Teaching and Learning (4)
This course introduces students to educational resources, both in print and on-line. Students compile and evaluate research studies, curricular materials, and instructional approaches in preparation for future projects in developing and evaluating various approaches to teaching and learning. *Prerequisite: students must be registered TEP graduate students.*

TEP 203. Technology, Teaching, and Learning (4)
This course will review current literature on effective applications of technology in the classroom. Students will also become fluent in the use of productivity tools, presentation software, and Web development for teaching and learning; critique software relevant to their area of teaching; and develop an educational activity based on their review of the literature that harnesses the power of technology. *Prerequisite: students must be registered TEP graduate students.*

TEP 204. Technology and Professional Assessment (4)
Advanced techniques for using network-based resources for teaching and learning will be introduced. Students will review relevant research on advanced technologies related to assessment of professional performance and student achievement. Students will present a Web based professional Teaching Performance Assessment Portfolio that reflects teaching performance during their student teaching or internship field experience. *Prerequisite: students must be registered TEP graduate students.*

TEP 205 A-B. Reflective Teaching Practice (2-2)
This course introduces principles and practices of reflective teaching. Student teachers and interns will systematically document their practice teaching and analyze observation data to improve performance. Students will collaborate with supervisors and expert teachers throughout the yearlong preservice teaching experience. *Prerequisite: students must be registered TEP graduate students.*

TEP 206. Teaching Performance Assessment Portfolio (4)
This course introduces the use of a Teaching Performance Assessment Portfolio for assessment of teaching performance. Student teachers and interns will design an electronic portfolio that demonstrates acceptable performance on essential credential standards. National Board of Professional Teaching Standards will also be introduced. *Prerequisite: students must be registered TEP graduate students.*

TEP 229. Introduction to Educational Resources (4)
This course prepares K-12 teacher-researchers to design, implement, and evaluate classroom research. Students learn how to access and evaluate research studies, curricular materials, and instructional approaches both on-line and in print. *Prerequisite: students must be registered TE76 majors.*

TEP 230A-B-C. Research on Curriculum Design (4-4-4)
A year-long course sequence which provides an extensive overview of curriculum design principles appropriate for K–12 instruction. Consensus and model building methods will be discussed using case studies of curriculum research and development projects appropriate for various subject areas and grade levels. Participants will design, implement, and evaluate a curriculum project in their own classrooms. *Prerequisite: must be TE76 major or consent of instructor.* (F,W,S)

TEP 231. Advanced Instructional Practices (4)
Selected advanced topics in K–12 instructional practices in various subject areas. Techniques for teaching higher-level cogni-tive processes and advanced applications of computers and other technology will be stressed. Participants will conduct a field study of promising teaching practices appropriate to their grade level(s) and subject area(s) of instruction. *Prerequisite: must be TE76 major or consent of instructor.* (Su)

TEP 232. Special Topics in Education (4)
This course explores topical issues in education. It focuses on recent developments which have broad implications for research and practice in teaching and learning. Course topics will vary each time the course is offered. *Prerequisite: must be TE76 major or consent of instructor.* (Su)

TEP 233A-B. Topics in Education Research and Design (2-2)
Current topics and issues in education and educational research methodology, including action research, participant observation, ethnography, and survey research. *Prerequisite: must be TE76 major or consent of instructor.*

TEP 240A-B-C. Research in ASL English Bilingual Education (4-4-4)
A three-course sequence in which participants conduct an overview of research and design and conduct a study related to bilingual, bicultural education for deaf children. *Prerequisite: must be TE81 major or consent of instructor.* (F,W,S)

TEP 241. Advanced Topics in Deaf Education (2)
Topics in human development and education that relate to deaf and hard-of-hearing children and the relationship between home, community/culture, and classroom. *Prerequisite: must be TE81 major or consent of instructor.* (S)

TEP 250. Equitable Educational Research and Practice (4)
This course introduces students to research studies and educational practices of educational equity, both in general and within specific content areas. Research studies relevant to educational equity will be examined, as will practices that have attempted to enable all students to achieve to the best of their abilities. Prerequisite: *students must be registered TEP graduate students.*

TEP 260 A-B-C. Educational Research and Evaluation Design (4-4-4)
This course integrates a variety of social and behavioral science perspectives and research methodologies in examining topics of central relevance to education. Students have opportunities to design and apply to educational research questions a variety of methodologies including: survey, interview, ethnographic, case study, video data analysis, and discourse analysis methods. *Prerequisite: students admitted into the Ed. D. Program or consent of instructor.*

TEP 261 A-B-C. Advanced Research and Evaluation Methods (4-4-4)
This course addresses more advanced topics in research design and methodology. Students hone the requisite research skills to conduct dissertation research. Students gain varied hands-on experiences in collecting and analyzing data relevant to schooling, as well as learn how to develop, manage, and analyze large data files. Students create a research agenda and develop skills needed in proposal writing: development, organization and coherence, conceptualization of research design, and attention to audience and writing style. *Prerequisite: students admitted into the Ed. D. Program or consent of instructor.*

TEP 262 A-B-C. Dissertation Writing Seminar (4-4-4)
This seminar provides an opportunity for doctoral candidates to present and critique in-progress dissertation research and writing. Topics addressed will also include: writing for professional publications and presenting research findings to varied audiences. *Prerequisite: students admitted into the Ed. D. Program, or consent of instructor.*

TEP 270. Leadership and Equity in Educational Reform (4)
This course provides a framework for understanding school reform movements that integrates relevant theory and research from a number of academic disciplines. *Prerequisite: students admitted into the Ed. D. Program or consent of instructor.*

TEP 271. Language and Diversity in the Schooling Process (4)
This course examines current research and theory which relate language and diversity to educational outcomes. Topics addressed include: the development of language and literacy in schools and other settings, sociocultural perspectives on language learning, and implications for educational policy and practice. *Prerequisite: students admitted into the Ed. D. Program or consent of instructor.*

TEP 272. Education and Culture (4)
This course examines schooling from an anthropological perspective, focusing on the impact of social and cultural forces on teaching and learning in U.S. public schools with comparative materials from other societies and settings. *Prerequisite: students admitted into the Ed. D. Program or consent of instructor.*

TEP 273. Research in Teaching and Learning: Reading and Writing (4)
This seminar will address current theories and research on the teaching and learning of reading and writing, as well as how research can be used to analyze and foster effective teaching practices. *Prerequisite: students admitted into the Ed. D. Program or consent of instructor.*

TEP 274. Research in Teaching and Learning: Mathematics (4)
This seminar will address current theories and research on the teaching and learning of mathematics, as well as how research can be used to analyze and foster effective teaching practices. *Prerequisite: students admitted into the Ed. D. Program or consent of instructor.*

TEP 275. Research in Teaching and Learning: Science (4)
This seminar will address current theories and research on the teaching and learning of science, as well as how research can be used to analyze and foster effective teaching practices. *Prerequisite: students admitted into the Ed. D. Program or consent of instructor.*

TEP 276. Research in Teaching and Learning: English Language Learning (4)
This seminar will address current theories and research on the teaching and learning of second language learning, as well as how research can be used to analyze and foster effective practices in teaching English to non-native speakers. *Prerequisite: students admitted into the Ed. D. Program or consent of instructor.*

TEP 277. Research in Teaching and Learning: History and Social Sciences (4)
This seminar will address current theories and research on the teaching and learning of social sciences, as well as how research can be used to analyze and foster effective teaching practices. *Prerequisite: students admitted into the Ed. D. Program or consent of instructor.*

TEP 278/COGR 278. Talking Culture, Culture Talking: Voices of Diversity (4)
This course explores the discourse of culture in American society and the problem of "silenced" or unheard voices. The interaction of individual and collective voice, language, and identity are discussed as they bear on the ways that culture moves through important social institutions such as schools. Of particular interest are issues of teaching, learning, displacement, inclusion, marginality, and the "speaking center." *Prerequisite: graduate status or consent of instructor.*

TEP 290. Research Practicum (1-6)
Supervised research studies with individual topics selected according to students' special interests. Students will develop a research proposal appropriate for M.A. thesis, begin to gather and analyze data. *Prerequisites: M.A. candidate and consent of instructor.* (S/U grades only.)

TEP 295. M.A. Thesis (4)
The student will work on the M.A. thesis under the direction of the students' thesis committee chair. *Prerequisites: M.A. candidate and consent of committee chair.* (S/U grades only.)

TEP 297. Directed Group Study (1-6)
Study and analysis of specific topics under the guidance of a faculty member. Offered for repeated registration. *Prerequisite: consent of instructor.*

TEP 298. Independent Study (1-6)
Individual guided study and/or independent research in an area not covered by present course offerings. Offered for repeated registration. *Prerequisite: consent of instructor.*

TEP 299. Dissertation Research (1-12)
Directed research on dissertation topic for students who have been admitted to candidacy for the Ed.D. degree. May be repeated for credit. *Prerequisite: students admitted into the Ed.D. program.*

TEP 500. Apprentice Teaching in Education (2-4)
The course, designed for graduate students serving as teaching assistants in teacher education courses, includes discussion of teaching theory and practice, instructional materials, organization of discussion sections, liaison with participating schools, and methods of evaluation/grading under the supervision of the instructor of the course.

Theatre and Dance

OFFICE: 202 Galbraith Hall, Revelle College
(858) 534-3791
Web site: http://theatre.ucsd.edu

Professors

Andrei Both, M.F.A., *Scenic Design*
Frantisek Deak, Ph.D., *Criticism and Theory (Dean, Arts and Humanities)*
Judith A. Dolan, Ph.D., *Costume Design*
Kyle Donnelly, M.F.A., *Arthur and Molli Wagner Chair in Acting, Acting and Directing*
Deborah M. Dryden, *Emeritus, Costume/Set Design*
Floyd Gaffney, Ph.D., *Emeritus, Dance/Movement*
Allan Havis, M.F.A., *Playwriting*
Jorge A. Huerta, Ph.D., *Chancellor's Associates' Endowed Chair III, Dramatic Literature*
James Ingalls, B.F.A., *Lighting Design (Adjunct)*
Walt Jones, M.F.A., *Chair, Directing/Acting/Film*
Marianne McDonald, Ph.D., *Dramatic Literature*
Chris Parry, *Lighting Design*
Adele Edling Shank, M.A., *Playwriting*
Theodore Shank, Ph.D., *Emeritus, Directing*
Janet Smarr, Ph.D., *Literature and Italian Studies*
Yolande Snaith, B.A., *Theatre*
Arthur Wagner, Ph.D., *Emeritus, Acting/Directing*
Les Waters, B.A., *Directing and Acting*
James R. Winker, M.F.A., *Academic Senate Distinguished Teaching Award, Acting*

Associate Professors

Steven Adler, M.F.A., *Stage Management and Directing*
James Carmody, Ph.D., *Dramatic Literature*
Mary Corrigan, M.A., *Emeritus, Voice*
Tony Curiel, M.A., *Acting and Directing*
Nadine George-Graves, Ph.D., *Dramatic Literature*
Allyson Green, M.F.A., *Dance*
Luther James, *Emeritus, Acting/Playwriting*
John Rouse, Ph.D., *Dramatic Literature*
Jonathan Saville, Ph.D., *Emeritus, Literature/Criticism*
Carol Ann Smart, B.A., *Scenic and Costume Design (Adjunct)*

Assistant Professor

Victoria Petrovich, M.F.A., *Design*

Senior Lecturers with Security of Employment

Margaret Marshall, M.F.A., *Ballet, Dance History, Choreography*
Ursula Meyer, M.F.A., *Voice and Acting*
Charlie Oates, M.F.A., *Movement and Acting*
Patricia A. Rincón, M.F.A., *Modern and Jazz Dance*

Lecturer with Security of Employment

Eva W. Barnes, M.F.A., *Speech*

Lecturers

Kristin Arcidiacono, B.F.A., *Tap Dance and Musical Theatre*
Tony Caligagan, *Jazz Dance*
Sandra Foster-King, M.F.A., *Modern, Jazz, and African Dance*
Jean Isaacs, B.A., *Modern Dance*
Alicia E. Rincón, M.F.A., *Jazz Dance*
Todd Salovey, M.F.A., *Acting and Directing*
Amy Scholl, M.F.A., *Acting*
Judith A. Sharp, B.S., *Ballet and Music for Dancers*
Linda Vickerman, D.M.A., *Singing*

The Undergraduate Program

The curriculum of the Department of Theatre and Dance is based on the belief that a good undergraduate education in theatre or dance should provide the student with a solid background in dramatic literature and the aesthetics and history of theatrical performance as well as exposure to the different artistic components of theatrical art—performance, playwriting, design, and choreography. Finally, such an education should incorporate participation in the production process itself.

In addition to providing an integrated program for students desiring a theatre or dance major, the curriculum provides (1) a sequence of courses to fulfill the fine arts and/or humanities requirements for Muir College; (2) courses fulfilling Warren College's program of concentration requirements; (3) courses to fulfill Revelle, Thurgood Marshall, and Eleanor Roosevelt Colleges' fine arts requirements; (4) public speaking courses to fulfill requirements in the Schools of Engineering and Pharmacy; and (5) elective courses for the general student desiring experience in theatre or dance.

Any student who has been accepted to the University of California, San Diego is eligible to declare theatre or dance as a major, double major, or minor. Auditions are not required. Continuing UCSD students who are changing their major to theatre or dance must file a Change of Major form with the UCSD Registrar's Office.

The Theatre Major

The theatre major provides a student with a solid artistic and academic background. The required lower-division courses equip the student with the skills and knowledge necessary for more advanced work in each of the areas of study. The major is structured so that it can respond to the needs of students who seek a broad-based "liberal arts" education in theatre as well as those who plan to pursue their studies at the graduate level with the aim of acquiring either an M.F.A. or Ph.D. degree. Students should meet with the department's undergraduate coordinator the quarter in which they declare a theatre major in order to plan an appropriate individual course of study.

The major requirements are those published in the catalog in effect for the first quarter in which a student attends UCSD. Any student in good standing may declare a theatre major by completing the appropriate form at the Registrar's Office. A department stamp is not necessary.

The Dance Major

The department proudly opened a new state-of-the-art dance studio facility, designed by award winning and nationally recognized architect Antoine Predock in winter 1998. Christened the Molli and Arthur Wagner Dance Facility in 2001, the facility features three naturally lit and temperature controlled studios with superior acoustics and expansive views of an embracing grove of eucalyptus trees.

The dance major provides dancers with a solid academic base on which to build their dance technique education. The UCSD dance faculty believe that an understanding of the principles and theories of dance as a creative art is a vital component of any comprehensive training in dance. Instruction in dance seeks to promote the development of an intellectual understanding of dance history and dance aesthetics along with refinement of technical skill. Instruction in choreography allows the student to progress from approaching dance education as a question of technical skills to engaging in dance as a creative endeavor. The dance major provides a solid academic base through training in several dance

idioms, a background in dance history, numerous performance opportunities, and extensive experience in dance choreography.

The major requirements are those published in the catalog in effect for the first quarter in which a student attends UCSD. Any student in good standing may declare a dance major by completing the appropriate form at the Registrar's Office. A department stamp is not necessary.

The Theatre-Dance Double Major

The double major in Theatre and Dance provides students with a solid academic base and an artistic base in both theatre and dance disciplines. Furthermore, requirements for this double major will create stronger and more experienced directors (for their exposure to choreography), choreographers (for their exposure to directing), actors (for the poise and strength they will attain from dance), and dancers (for having confronted text and character).

Students should meet with the department's undergraduate adviser as soon as practical (but no later than the quarter in which they declare the major) in order to plan an appropriate individual course of study.

Double majors should complete the Petition for Double Major form obtained from their college and submit it to the department for review and approval.

Department of Theatre and Dance Advising

The Department's undergraduate faculty advisers can provide guidance and answers to your questions concerning specific course content, transfer coursework, honors research projects, academic success, production, auditioning procedures, postgraduate opportunities, and departmental policy changes.

The undergraduate coordinator can answer your questions regarding major requirements, procedural matters, class enrollment, the petition process, and give referrals to faculty and other campus resources for specific information.

The undergraduate student representatives are another important resource for theatre and dance majors. The studnet reps organize quarterly meetings at which students and faculty discuss departmental issues and concerns.

The department regularly communicates with our majors and minors as well as other students involved in our classes and productions through the campus email and listserver systems. Students are strongly urged to check their campus email accounts for timely messages or to make arrangements with Academic Computing Services to have campus email forwarded to any other email account they may use. Additionally, a handbook containing useful information is available in the department office, room 202, Galbraith Hall.

Satisfying Your Major Requirements

At least 50 percent of all course work required for the theatre or dance major (including both upper- and lower-division) must be taken at UCSD, regardless of approved transfer work, petitions, and the theatre residency requirement. Theatre practicum (THPR) classes, completed elsewhere do not satisfy the theatre and dance department's requirements unless they have been formally petitioned and approved. Only one practicum class from another institution may be petitioned. All courses required for the major or minor must be taken for a letter grade. A theatre and dance department course for which a student earns a grade lower than C– will not satisfy any of the department's graduation requirements. Four units of Instructional Assistance (THGE 195, P/NP credit) may be used as an upper-division elective for the theatre major, double major, or minor.

Major Requirements

Theatre majors are required to complete ten lower-division courses. Dance majors are required to complete three lower-division courses. All lower-division courses should be satisfied before starting upper-division course work in the respective areas.

Majors and minors should complete a practicum course, either THPR 1, THPR 2, THPR 3, or THPR 5, within three quarters of declaring their major or minor. Theatre majors should plan to complete their second practicum requirement as soon as possible therafter, as space in these classes is limited.

Theatre History 10, 11, 12, and 13 are prerequisites for most upper-division theatre history and theory courses. Introduction to Acting (THAC 1), Theatre Design (THDE 1), and Theatre Playwriting (THPW 1) are all prerequisites for any upper-division course work in their respective areas. Students should take these classes as soon as possible after declaring their major. Prerequisites ensure that students are properly prepared for the work required. Not completing prerequisites could therefore jeopardize your GPA.

Theatre majors are required to complete twelve upper-division courses. Dance majors must complete thirteen upper-division courses. Specific courses will vary for each student depending upon electives and history/theory courses selected.

THEATRE MAJOR

Lower-Division Requirements

1. Two courses selected from:

   THPR 1. Practicum–Scenery

   THPR 2. Practicum–Costume

   THPR 3. Practicum–Lighting

   THPR 5. Practicum–Sound

NOTE: Please refer to text, above, for specific information concerning practicum requirements. Theatre majors are required to take a second practicum course in an area different from their initial practicum course.

2. Each of the following :

   THHS 10. Introduction to Play Analysis

   THHS 11. History of Theatre 1: Classical to Renaissance

   THHS 12. History of Theatre 2: Neoclassicism to Realism

   THHS 13. History of Theatre 3: Symbolism to Postmodernism

3. THGE 1. Introduction to Theatre

NOTE: THHS 10 and one of the other lower-division THHS courses are the typical prerequisites for most upper-division theatre history courses. Please check prerequisites carefully.

4. Each of the area threshold classes:

   Performance Area—
   a) THAC 1. Introduction to Acting

   Design Area—
   b) THDE 1. Introduction to Design

   Playwriting Area—
   c) THPW 1. Introduction to Playwriting

NOTE: The threshold classes listed above must be completed before taking upper-division courses in their respective areas.

Upper-Division Requirements

4. One upper-division four-unit acting course

5. One upper-division four-unit design course
6. One upper-division four-unit directing course
7. One upper-division four-unit playwriting course
8. One upper-division four-unit stage management course
9. Three upper-division four-unit theatre history courses
10. Four upper-division four-unit theatre electives

NOTE: THGE 197 and 199 may not be used as upper-division electives by theatre majors unless approved by petition.

DANCE MAJOR

Lower-Division Requirements

1. One course from:

   THPR 1. Practicum–Scenery

   THPR 2. Practicum–Costume

   THPR 3. Practicum–Lighting

   THPR 5. Practicum–Sound

NOTE: Students should complete the THPR requirement within one year of declaring a dance major.

2. THAC 1. Introduction to Acting
3. THDA 25. Music for Dancers (four units)
   NOTE: This course may not be offered every year.

Upper-Division Requirements

4. THDA 160. Dance Movement Analysis and Injury Prevention Techniques
   NOTE: This course may be offered every other year.
5. THDE 121. Theatre Production: Lighting
   NOTE: This course may be offered every other year.
6. Three choreography courses:

   THDA 141. Principles of Choreography

   THDA 142. Choreography and Performance

   THDA 143. Choreography for Dramatic Text

7. Four history and theory courses. Choose from the following:

   THDA 151. Dance History–Ballet

   THDA 152. Dance History–Modern Dance

   THDA 153. Dance History–Jazz Dance and Related Ethnic Studies

   THDA 159. Dance Criticism and Aesthetics

   THHS 114. American Musical Theatre

8. Three advanced movement courses in one of the following areas of emphasis:

   THDA 102A-B, or C or 103A-B, or C. Ballet

   THDA 111A-B, or C or 112A-B, or C. Modern

   THDA 121A-B, or C or 122A-B, or C. Jazz

9. One advanced movement course outside the area of emphasis selected in number 8.

THEATRE AND DANCE DOUBLE MAJOR

Lower-Division Requirements

1. One course from

   THPR 1. Practicum–Scenery

   THPR 2. Practicum–Costumes

   THPR 3. Practicum–Lighting

   THPR 5. Practicum–Sound

NOTE: Students should complete the THPR requirement within one year of declaring the double major.

2. THAC 1. Introduction to Acting
3. THDA 25. Music for Dancers
   NOTE: This course may not be offered every year.
4. Each of the following threshold classes:

   THDE 1. Introduction to Design

   THPW 1. Introduction to Playwriting

NOTE: Students should complete the threshold class requirement before taking any upper-division course in each respective area.

Upper-Division Requirements

5. One upper-division four-unit acting course
6. One upper-division four-unit design course
7. One upper-division four-unit directing course
8. One upper-division four-unit playwriting course
9. One upper-division four-unit stage management course
10. Six upper-division four-unit theatre and dance history courses (THHS 114 required as one of the six upper-division history courses)
11. Four upper-division theatre electives (with no more than two from the core dance curriculum)
12. THDA 160. Dance Movement Analysis and Injury Prevention Techniques
    NOTE: This course will only be offered every other year.
13. THDE 121. Theatre Process: Lighting
    NOTE: This course may only be offered every other year.
14. Three four-unit choreography courses

    THDA 141, 142, and 143

15. Three advanced movement courses (four units each) in one of the following areas of emphasis:

    THDA 102A-B, or C or 103A-B, or C. Ballet

    THDA 111A-B, or C or 112A-B, or C. Modern

    THDA 121A-B, or C or 122A-B, or C. Jazz

16. One four-unit advanced movement course outside the area of emphasis selected in number 15.

NOTE: THGE 197 and 199 may not be used as upper-division electives by theatre and dance majors unless approved by petition.

Honors Program

The department offers a special program of advanced study for outstanding undergraduates majoring in theatre or dance. Successful completion of the Honors Program enables the student to graduate "With Highest Distinction" (A+), "With High Distinction (A), or "With Distinction" (A–), depending upon performance in the program.

Eligibility

1. Junior standing (ninety units or more completed)
2. 3.7 GPA or better in the major
3. 3.5 GPA or better overall, which student must maintain until final graduation
4. Completion of at least four upper-division theatre courses
5. Recommendation of a faculty sponsor who is familiar with the student's work

Guideline

Application to the Honors Program may be made upon completion of ninety units or no later than the fifth week of the quarter preceding the final two quarters before graduation.

The Undergraduate Committee will consider the application and, if approved, the student and the principal adviser will have the responsibility of proposing an Honors Thesis Committee to the Undergraduate Committee for final approval.

Students are required to take THGE 196A, Honors Studies in theatre and 196B, Honors Thesis in theatre, in addition to the thirteen upper-division required courses for the major, THGE 196A-B are to be taken consecutively and may not be taken concurrently.

PLACEMENT AND PROFICIENCY FOR DANCE MAJORS

The technical command and the expansion of a vocabulary of movement are essential to the dancer's creative expression. The faculty advise new students in dance to participate in beginning dance in all areas for a minimum of one year. These courses are designed to give the student the basic information needed to move on to the intermediate level II. The intermediate level is level II in all areas, and students should remain in this level for a minimum of one year unless the instructor encourages you to advance to level III. All students are required to audition and be approved by the faculty to be enrolled in all level III advanced, and level IV advanced dance courses. If you come to UCSD with a background in dance and would like to take an advanced class you need to audition in the class of your choice on the first day of the class meeting so that the teacher can accept you in the class or recommend another more appropriate class.

DEPARTMENTAL DEGREE CHECK

Departmental degree checks are completed upon request by the undergraduate coordinator. A degree check monitors your progress toward fulfillment of the theatre or dance majors or minors. It is suggested that you request a degree check at least once per year and particularly the quarter before graduation. You may call or stop by the Department of Theatre and Dance office to make an appointment for an unofficial degree check for your major. Remember you must also complete a degree check with your provost office prior to graduation. The provost office degree check will monitor all university and college requirements, such as GPA, units, residency requirements, P/NP limits, college general-education requirements, etc.

UNDERGRADUATE STUDENT PETITIONS

Undergraduate student petitions are required whenever an exception to a rule is being requested. They are required for: major or minor requirement substitutions; substitution of courses from other departments or institutions; late course adding or dropping; or requesting a retroactive incomplete grade. The petition process can take several weeks, depending on the request. Submit petitions for course substitutions well in advance of taking the course. To ensure that your petition is complete and well documented, have the Department of Theatre and Dance undergraduate coordinator assist you with the petition process if you have difficulty with the form. Incomplete or incorrectly completed forms may significantly increase the amount of time required to process your request.

ARTICULATION AGREEMENTS

As a prospective transfer student to UCSD, it is important to make sure that the community college courses you take are transferable to UCSD for transfer credit. Every California community college has an agreement with the University which specifies which of its courses receive UC transfer credit. These courses are listed in a Transferable Course Agreement, a document which is available from your community college counselor or from the Office of Admissions and Outreach at UCSD.

RECEIVING TRANSFER CREDIT

You must petition the department to substitute courses taken in another department or institution for courses required by the Department of Theatre and Dance. The following procedures and guidelines will help you with the transfer petition process.

First, review the Department of Theatre and Dance residency requirement. It is generally a good idea to petition a course before you take it. The Department of Theatre and Dance undergraduate faculty will review petitions for all transfer courses. Students may obtain a General Undergraduate Student Petition form at the department office, at their college, or online at the Registrar's Forms Web site. A detailed syllabus for the course to be evaluated must be attached to the completed petition form. Any petition relating to courses within the Department of Theatre and Dance should be dropped off at the main office during normal working hours.

Transfer credits must be accepted by the Admissions Office at the appropriate level and for the appropriate number of units for the substitution to be effective. Upper-division credit cannot be given for lower-division work. Course work done at a junior college can only transfer to UCSD as lower-division credit.

The Theatre Minor

Students should submit an Undergraduate Declaration of a Minor form to the department prior to their junior year. **Minor courses may not be taken on a Pass/No Pass basis.**

The minor requirements are those that are published in the catalog in effect during the first quarter in which a student attends UCSD.

Lower-Division Minor Requirements

1. One course from:

   THPR 1. Practicum–Scenery

   THPR 2. Practicum–Costumes

   THPR 3. Practicum–Lighting

   THPR 5. Practicum–Sound

   Note: Students must complete the THPR requirement within one year of declaring a theatre minor.

2. At least one course from the following list:

   THHS 11. History of Theatre 1: Classical to Renaissance

   THHS 12. History of Theatre 2: Neoclassicism to Realism

   THHS 13. History of Theatre 3: Symbolism to Postmodernism

   Note: THHS 11, THHS 12, and THHS 13 are prerequisites for many upper-division courses in history and theory. Please plan accordingly.

   THAC 1. Introduction to Acting
   Note: THAC 1 must be completed before taking any upper-division courses in Acting.

   THDE 1 Introduction to Design
   Note: THDE 1 must be completed before taking any upper-division courses in Design.

   THPW 1. Introduction to Playwriting
   Note: THPW 1 must be completed before taking any upper-division courses in playwriting

Upper-Division Requirements

3. Any five four-unit, upper-division theatre courses.

The Dance Minor

The dance minor consists of courses that concentrate on the principles of composition and choreography, the history of dance, and the process of performance. Dancers receive extensive training in one or more idioms (ballet, modern dance, jazz dance, and musical theatre). The dancer's training also includes participation in compositional workshops and productions including historical and contemporary performance experiences. Students should consult the dance adviser, if necessary, and submit their completed minor petition form to the undergraduate coordinator prior to their junior year. **Minor courses may not be taken on a P/NP basis.**

DANCE MINOR REQUIREMENTS

Lower-Division Requirements

1. One course from:
   THPR 1. Practicum–Scenery
   THPR 2. Practicum–Costumes
   THPR 3. Practicum–Lighting
   THPR 5. Practicum–Sound

Upper-Division Dance Requirements

2. One course selected from:
   THDA 140. Dance Improvisation
   THDA 141. Principles of Choreography
   THDA 142. Choreography and Performance
   THDA 143. Choreography and Dramatic Text
3. One course selected from:
   THDA 151. Dance History—Ballet
   THDA 152. Dance History—Modern
   THDA 153. Dance History—Jazz
   THDA 159. Dance Criticism and Aesthetics

DANCE MINOR MOVEMENT REQUIREMENTS (sixteen units total)

A prerequisite for entrance into the dance minor is technical ability above the beginning level in ballet, jazz, or modern. The student's level is determined by audition and, depending on his or her technical ability, the student will be placed at the intermediate or advanced level. Students wishing to enter the minor without intermediate (level II) proficiency must take beginning (level I) courses (up to two years) or until they pass an audition into level II.

3. Choose the total sixteen units from a combination of the following list of movement courses. **(Note:** Levels II, III, or IV courses may be repeated once for credit.)

   THDA 101A-B, or C. Ballet II (Intermediate, 2 units each)

   THDA 102A-B, or C. Ballet III (Advanced 1, 4 units each)

   THDA 103A-B, or C. Ballet IV (Advanced 2, 4 units each)

   THDA 110A-B, or C. Modern II (Intermediate, 2 units each)

   THDA 111A-B, or C. Modern III (Advanced 1, 4 units each)

   THDA 112A-B, or C. Modern IV (Advanced 2, 4 units each)

   THDA 120A-B, or C. Jazz II (Intermediate, 2 units each)

   THDA 121A-B, or C. Jazz III (Advanced 1, 4 units each)

   THDA 122A-B, or C. Jazz IV (Advanced 2, 4 units each)

(Only movement courses from the above list may be used.)

THEATRE AND DANCE PERFORMANCE AND PRODUCTION OPPORTUNITIES

The Department of Theatre and Dance produces undergraduate productions throughout the academic year. These productions range in scale from student directed "black box" productions to full-scale faculty directed undergraduate productions on the mainstage. Every effort is made to provide a faculty directed opportunity for undergraduates each quarter. THGE 108, a one-unit course under the supervision of the faculty director of theatre, is required by all students (except crews) involved in departmentally produced productions.

Each of these productions is staged with undergraduate actors and dancers. Historically, where there are design assignments to be made (sets, costumes, lights, sound), those assignments are given to qualified undergraduates. Upper-division credit is available for students involved in the design or staging of department productions. Students may not work on department productions unless they are formally enrolled in a related class. Information regarding design and advanced crew opportunities is typically available from the design faculty or may be posted on the bulletin board in the lobby of Galbraith Hall as opportunities arise.

Cabaret

Cabarets are independent productions that are produced in Galbraith Hall 157. Students may submit proposals for cabarets one quarter in advance to the cabaret manager. The cabaret policy is subject to revision on a quarterly basis.

Undergraduate Audition Policy

Undergraduates are encouraged to audition for all shows produced in the department. Auditions are typically held in the quarter preceeding the staging of a production. Audition announcements will be posted on the bulletin board in the lobby of Galbraith Hall. Undergraduates who have completed or are currently enrolled in THAC 1–Introduction to Acting are eligible to audition. Qualified undergraduates may audition for roles in graduate productions as they are available.

UCSD Dance Repertory

This repertory is open to dance students through auditions. The company will perform lecture-demonstrations, performances, and teach master classes in the community or at other UC campuses.

Annual Dance Concerts

Two main stage dance concerts are presented each year. In winter quarter's "An Evening of Dance," students perform choreography created by the professional faculty and international guest artists in the Mandell Weiss Center for the Performing Arts; and in spring quarter's "New Works" student dance concert, students perform the faculty directed experimental choreographic works for other students at the Mandeville Center Auditorium. In addition, smaller productions take place in our newly built and intimate Studio Theatre, located in the dance facility. Auditions are held at the beginning of the quarter for all productions. Students interested in performing in the winter concert must audition for a specific repertory class taught by the faculty or guest choreographer with whom they wish to work. Students who are then cast must enroll in both the appropriate Dance Repertory (THDA 131) and Studies in Performance (THDA 130). Students interested in performing in the spring concert must audition at the beginning of spring quarter; if cast, they enroll in Studies in Performance (THDA 130). Students participating in either dance production are required to be concurrently

attending a technique class. Students who wish to choreograph for the spring concert must have completed or be concurrently enrolled in a choreography class.

Professional Dance Internship

Dance students may apply for positions as interns. These internships provide qualified students an opportunity to work with, observe, and perform in professional companies. Internship possibilities include work with Patricia Rincon Dance Collective, California Ballet Company, San Diego Dance Institute, San Diego Dance Theatre, and other San Diego area professional dance companies. Interested students should discuss internship opportunities with the dance faculty.

Ushering

Undergraduates can volunteer to usher for a performance of most theatre events. Ushering is a great way to see the shows for free. Contact the promotions manager for more information.

Comps

Declared theatre and dance majors are eligible to receive a complimentary Major's Card. Declared majors may obtain their Major's Card by bringing their student ID to the department office after the second week of the fall quarter. The Major's Card may be redeemed for one free ticket, subject to availability, for each of the department's productions.

The Graduate Program

Master of Fine Arts in Theatre
Joint Doctoral Degree Program

M.F.A. in Theatre

The Department of Theatre and Dance has set an ambitious goal for its M.F.A. program: the training of artists who will shape the future direction of the theatre. The professional theatre training program is ranked third in the nation (and first west of the Hudson River) [*US News and World Report, 1997*].

The curriculum for all students involves studio classes and seminars. These are integrated with a progressive sequence of work on productions and with a professional residency at the La Jolla Playhouse.

The M.F.A. program at UCSD is built around the master-apprentice system of training. All the faculty are active professionals who teach at UCSD because of a shared commitment to training young artists. Instruction takes place not just in the classroom, but in theatres around the country where faculty, with students as assistants, are involved in professional productions, including those at the La Jolla Playhouse.

Students graduating from the M.F.A. program at UCSD should be prepared to take positions in the professional theatre in the United States and abroad. Students are now working in New York, in resident theatres, in the film and television industry, and in European repertory theatres. M.F.A. candidates in acting, design, directing, playwriting, and stage management will complete at least ninety quarter-units of academic work during their tenure in the program.

Program Descriptions

ACTING

The body and mind of the actor are synthesized to serve as an instrument of expression. Actors must depend on their instrument to perform, and the program places great emphasis on the strengthening and tuning of that instrument. The innate talent of the student is nurtured, coaxed, and challenged with individual attention from an extraordinary team of professionals and specialists in actor training.

Classes

Each year, intensive studio work in movement, voice, speech, and singing accesses, expands, and frees the physical body. Acting process introduces a range of improvisational and rehearsal techniques that help the actor approach onstage events with imagination and a rich emotional life. In the first year, studio classes guide the actor through daily explorations that encourage, change, and enhance artistic expression. The second year is devoted to the study of classical texts as well as the specific vocal and physical skills required to perform them. In the final year, classes focus on the needs of individual actors as they prepare to enter the professional world.

Productions

Actors work on classical and contemporary texts as well as new plays with graduate students, faculty, and professional guest directors. Each year the department schedules from fifteen to twenty productions of varying size and scope. Graduate students are given casting priority for all but a few plays. Student-scheduled and produced cabaret/workshop productions occur year-round and provide additional acting opportunities.

Externship

All graduate students serve a residency with the La Jolla Playhouse and are cast in positions ranging from supporting to leading roles alongside professional actors and directors of national and international stature. For many actors this opportunity establishes valuable networking relationships and exposure for future employment.

Research and Other Opportunities

Modest funds are sometimes available for the pursuit of research, special technique workshops, and travel to auditions and festivals. In addition, in the third year, the entire acting class receives a showcase presentation in both Los Angeles and New York at which specially invited groups of film, television, and theatre professionals are in attendance.

DESIGN

The design program aims to train students in the best professional practices of regional and commercial theatre. The design faculty are award-winning working professionals also committed to teaching. The design training program stresses an interaction with the works of many visual artists from a wide range of disciplines. Students are trained to create designs that "comment" on the play and the text, not merely "illustrate" it. Stu-dents' talent and design work are showcased at a number of venues that have directly resulted in many national grants, awards, and other work opportunities for our alumni.

Classes

All students take a core curriculum of first-year design studio classes in scenery, costume, and lighting (taken together with directors), and a design seminar where all three years come together in a forum to share production experiences, portfolios, and professional career techniques and skills. This is followed in subsequent years by more specialized Advanced Design classes which combine with production work in the student's own area of concentration. We are also able to offer a double-emphasis study (e.g., scenery and costume design combined) to appropriate students. Classes in other areas (e.g., drafting, text analysis, visual arts) are also normally offered.

Production

We offer a generous number of (fully executed) production opportunities, and generally all productions are designed by students. Designers collaborate with student, faculty, and internationally prominent guest directors. Students are fully supported by the same professional workshop staff as the La Jolla Playhouse and are not expected to build or run their own productions.

Externship

Student designers participate in a residency program at the La Jolla Playhouse, and normally work as assistants to visiting professional designers. However, there are also some opportunities for talented students to be hired as principal designers by the Playhouse during their season.

Research and Other Opportunities

Students may also be offered opportunities to travel with faculty as assistants on professional assignments to major regional theatres, Broadway, England, or Europe. Modest funds are sometimes available for student research and travel to see productions and to attend conferences and workshops.

DIRECTING

With an emphasis on the collaborative process, the Directing Program's purpose is to develop directors with a solid foundation in the components of production and the interpretation of text. Individuals are encouraged to make challenging choices, to break down barriers, and to create exciting, meaningful theatre. Graduates of the program are prepared to select and get to the heart of a text, communicate effectively with and inspire production designers, and elicit expressive performances from the actors with whom they work.

Classes

The core curriculum of the Directing Process Program offers students opportunities to hone their skills in text analysis and scene work in all three years. The first-year student also completes a sequence in the acting process and the development of a visual vocabulary in theatrical design and visual arts courses. Also in the first year, the techniques of London's Joint Stock Theatre Group (originators of such work as *Fanshen* by David Hare as well as *Fen* and *Cloud Nine* by Caryl Churchill) are explored in collaborative process, a course which explores community issues via theatrical means.

Production

Directing students will direct from two to four department scheduled and supervised productions in the Mandell Weiss Center for the Performing Arts during their time at UCSD. In addition, studio, workshop, and cabaret productions of the director's choice are strongly encouraged. The production season also offers opportunities to assist guest and faculty directors.

Externship

In the second year, the La Jolla Playhouse provides a residency during which students typically serve as assistant directors.

Additional Opportunities

It is common for the directing faculty to take M.F.A directors with them to work as assistant directors at theatres around the United States and internationally.

PLAYWRITING

Playwrights are more than mere writers. They are artists who unleash their imagination in incredibly dramatic ways. The successful playwright writes with intellectual power and emotional honesty, with a distinct and essential voice that speaks with vulnerability and sentience to the heart and soul of the audience. The dedicated, individual attention and formidable production opportunities of the program offer talented writers the ability to stretch, expand, and witness the unfolding of their work on stage in the bodies of very gifted actors.

Classes

In Playwriting Seminar—the core course—writers in all three years read and discuss their ongoing work, focusing on style, character, and structure. They also observe their work being read by M.F.A actors at times throughout the year. Writing for Television, Screenwriting, and Dramatization/Adaptation are offered in rotation within a three-year cycle. In addition, students take a variety of topics in theatre and dramatic literature along with individual practicum classes. Playwrights can take advantage of rich offerings in literature, music, visual arts, and language study, as well as dramatic texts, theory, and design.

Production

First-year students receive a one-act showcase production each year, while second- and third-year students receive a fully designed production. These are produced in the New Plays Festival each spring, which is attended by literary managers, agents, and artistic directors from across the country. Typically, these productions are directed, designed, and acted by students in the M.F.A. program. Production of plays in any year of study is dependent on the readiness of the work for staging.

Externship

Each student is assisted with a carefully chosen assignment, typically in the summer of the second year. Our playwrights may have an opportunity to gain exceptional literary and production experiences in a variety of theatres and venues in New York, Seattle, Los Angeles, London, Germany, and Romania.

STAGE MANAGEMENT

The stage manager is a pivotal member of the collaborative process who creates the environment that supports the work of the other members of the artistic team. The stage manager is the prime communicator and liaison who synthesizes the disparate elements of production into a cohesive whole and is responsible for the implementation of diverse artistic choices throughout the production process.

The Stage Management Program at UCSD integrates a comprehensive knowledge of all critical components of this complex field in order to prepare students for work in leading professional theatres. The program develops individualized, creative artists with personal approaches to their work. UCSD creates a supportive and stimulating environment that allows each student to develop the confidence and flexibility necessary to meet the challenges of production in a wide variety of professional venues.

Classes

All first-year students take a core curriculum in stage management process that explores the role of the stage manager in professional theatre today and offers a comprehensive investigation of the work from pre-production to closing a show. Students in all three years attend the stage management seminar, which serves as a weekly forum for sharing insights and solving problems on current production assignments, meeting with a variety of guest artists, and examining the bigger picture of stage management and theatre in America today. Additional coursework is

offered in various aspects of theatre administration and management, directing, drafting, design, and collaborative process.

Productions

Great emphasis is placed on the student's ability to apply the theories learned in class to the production process. Students typically serve as both ASM and SM on a number of studio and mainstage productions in a variety of theatrical spaces. In addition to established scripts directed by M.F.A., faculty, and nationally prominent guest directors, students also work on new plays by graduate or guest playwrights as well as faculty and student choreographed dance concerts.

Research Opportunities

Students are encouraged to work or research in the field when time permits. Past projects have included stage managing at the National Playwrights Conference at the O'Neill Center in Connecticut, interning at Warner Brothers Feature Animation, working as production assistant for the Broadway production of *Play On*, stage managing Andrei Serban's production of *Our Country's Good* at the Romanian National Theatre, and researching stage combat and weaponry at the Royal Shakespeare Company.

Externship

Each student is guaranteed at least one production opportunity at the La Jolla Playhouse, or a comparable professional residency experience.

Ph.D. in Theatre and Drama

The UCSD Department of Theatre and Dance and the Department of Drama at UC Irvine began to recruit students for the new Joint Doctoral Program in Theatre and Drama in fall 1999 for admission in fall 2000. Within the context of the program's twin focus on theory and history, an innovative structure permits each student to pursue a custom designed curriculum that draws from a rich variety of seminars in faculty research areas that include: Greek classical theatre; Shakespeare; neoclassical, modern, and contemporary French theatre; modern and contemporary German theatre; modernist and postmodernist theatre and performance; US Latino theatre; and theory.

Interested students are encouraged to request detailed information about the program and application materials, which will be available from either department each September.

Preparation

Students with a B.A. (minimum GPA: 3.5), M.A., or M.F.A. degrees in drama and theatre are eligible for admission to the doctoral program. We will also consider students with training in literature (or another area in the humanities), provided they can demonstrate a background in drama or theatre. Experience in one of the creative activities of theatre (acting, directing, playwriting, design, dramaturgy) will enhance chances of admission.

All applicants are required to take the Graduate Record Examination and to submit samples of their critical writing.

While not required for admission, a working knowledge of a second language is highly desirable (see Language Requirement).

COURSE OF STUDY

Students are required to take a minimum of 144 units, which is equivalent to four years of full-time study (full-time students must enroll for a minimum of twelve units each quarter). Forty of these units will be taken in required seminars; the balance will be made up of elective seminars, independant study, and research projects (including preparing the three qualifying papers), and dissertation research. Students must take a minimum of one seminar per year in the Department of Drama at UCI. The program of study makes it possible for students to take a significant number of elective courses and independent studies both with faculty in drama and theatre and in other departments.

Required Seminars

1. a minimum of twelve units of THGR 290 (Dramatic Literature and Theatre History to 1900)
2. a minimum of twelve units of THGR 291 (Dramatic Literature and Theatre History 1900 to the Present)
3. a minimum of sixteen units of THGR 292 (Cultural and Critical Theory)

These required seminars must be completed before the end of the student's third year. In addition to the ten required seminars, students must pass comprehensive examinations at the end of the first and second years (see "Comprehensive Examinations").

COMPREHENSIVE EXAMINATIONS

In the first year, students prepare for the written comprehensive examination, which is based on a reading list of approximately 150 titles ranging from the Ancient Greeks to the present. Students take the written comprehensive at the beginning of the fall quarter of the second year. (Comprehensive examinations are scheduled at the beginning of fall quarter in order to allow the students the summer to prepare.) Students who fail the written comprehensive may retake it no later than the first week of winter quarter of the second year. Students who fail the written comprehensive for a second time are dismissed from the program.

In the second year, students prepare for oral comprehensive examination. The reading list for this examination is designed to permit the student to acquire a knowledge of his or her dissertation subject area, broadly conceived. The reading list is compiled by the student and his or her dissertation adviser, in consultation with other members of the faculty, as appropriate; the reading list must be established by the end of winter quarter of the second year. Students take the oral comprehensive at the beginning of the fall quarter of the third year. Students also submit a dissertation prospectus (approx. five pages) at the time of the oral comprehensive. Students who fail the oral comprehensive may retake it no later than the first week of winter quarter of the third year. Students who fail the oral comprehensive for a second time are dismissed from the program.

Advancement to Candidacy: Three Qualifying Papers

Students normally select a dissertation adviser during the second year and must do so before the end of spring quarter of that year. In consultation with the dissertation adviser and other faculty members, students develop topics for three "qualifying papers," which are written during the third year. The three qualifying papers—one long (approx. fifty pages) and two short (approx. thirty pages each)—must be completed by the end of the third year; when completed, the qualifying papers provide the basis for the oral qualifying examination. Students write the long paper under the direction of the dissertation adviser; it is understood that the long paper is preparatory to the dissertation. The short papers deal with other related topics, sub-

ject to the approval of the student's advisers; the two short papers are understood as engaging in exploring the larger contexts of the dissertation. Students normally pass the qualifying examination and advance to candidacy at the end of the third year; students must advance to candidacy no later than the end of fall quarter of the fourth year. Once admitted to candidacy, students write the dissertation which, upon completion, is defended in a final oral examination. Students may select a dissertation adviser from either UCSD's Department of Theatre and Dance or UCI's Department of Drama. All UCSD doctoral dissertation committees must include at least one faculty member from UCI.

Language Requirement

Students are required to complete an advanced research project using primary and secondary material in a second language ("materials" should be understood as including live and/or recorded performance; interviews with artists, critics, and scholars; and other non-documentary sources, as well as more conventional textual sources). This requirement may be satisfied by writing a seminar paper or a qualifying paper (see "Advancement to Candidacy") that makes extensive use of materials in a second language. The second language requirement must be satisfied before the end of the third year. This requirement will not be waived for students who are bi- or multilingual; all students are required to do research level work in more than one language.

It is assumed that students will have acquired a second language before entering the doctoral program, although second-language proficiency is not a requirement for admission. While students may study one or more second languages while at UCI or UCSD, language classes may not be counted toward program requirements.

Teaching

Students are required to teach a minimum of four quarters. No more than eight units of apprentice teaching (THGR 500) may be counted toward the required 144 units.

Departmental Ph.D. Time Limit Policies

Students must advance to candidacy by the end of the fall quarter of their fourth year. Departmental normative time for completion of the degree is five years; total registered time in the Ph.D. program at UCSD or UCI cannot exceed seven years. While students with M.A. or M.F.A. degrees may be admitted to the Ph.D. program, they will be required to take all required doctoral seminars.

Financial Support

Ph.D. students entering the program with a B.A. may be supported (either by employment or fellowships) for five years. Students who have an M.A. and have been given transfer credit may be supported for four years. Such support depends upon the funds available, the number of students eligible, and the rate of progress.

*Contact department for application materials.

COURSES

Note: For changes in major requirements and in course offering implemented after publication, inquire at the office of the Department of Theatre and Dance.

The subject codes are:

THAC Acting
THDA Dance
THDE Design
THDR Directing, Stage Management
THGE General
THHS History and Theory
THPR Practicum
THPW Playwriting
THGR Graduate

TH/AC Acting

TH/AC 1. Introduction to Acting (4)
A beginning course in the fundamentals of acting: establishing a working vocabulary and acquiring the basic skills of the acting process. Through exercises, compositions and improvisations, the student actor explores the imagination as the actor's primary resource, and the basic approach to text through action. *Prerequisite: none.*

TH/AC 101. Acting I (4)
This course focuses on beginning scene study with an emphasis on exploring action/objective and the given circumstances of a selected text. *Prerequisite: THAC 1 or consent of instructor.*

TH/AC 102. Acting II (4)
Further study in the application of the given circumstances to a text and the development of characterization. The final stages of this course will be selection and preparation of audition material. *Prerequisite: THAC 101 or consent of instructor.*

TH/AC 104. Classical Text (4)
Studies of the heightened realities of poetic drama. Verse analysis, research, methods and how to approach a classical dialogue. *Prerequisite: THAC 102.*

TH/AC 107. Improvisation for the Theatre (4)
Improvisation for the theatre explores improvisation techniques as an alternative and unique approach to acting. Students should have a performance background. *Prerequistite: THAC 1.*

TH/AC 108. Advanced Topics (4)
Advanced topics in acting, such as Avant Garde Drama, Commedia, or Beckett, for students who possess basic acting techniques. *Prerequisite: THAC 102; department stamp.*

TH/AC 109. Singing for Actors (4)
This course introduces basic skills of breathing, placement, diction, musicianship, harmony, interpretation, and presentation needed by actors for roles requiring singing. Through a combination of group and individual coaching in class, students will prepare a program of short solo and ensemble pieces for a finals-week presentation. *Prerequisites: THAC 1 and audition; department stamp.*

TH/AC 111. Freeing the Voice (4)
Intensive workshop for actors and directors designed to "free the voice," with special emphasis on characteristics and vocal flexibility in a wide range of dramatic texts. This proven method combines experimental and didactic learning with selected exercises, texts, tapes, films, and total time commitment. *Prerequisite: THAC 101.*

TH/AC 112. Major Seminar in Acting (4)
An in-depth study seminar focused on special issues in acting as they relate to contemporary theatre. Of particular interest to students who plan to pursue a career in this area of theatre. *Prerequisites: department stamp; theatre majors only; upper-division only.*

TH/AC 115. Movement for Actors (4)
An exploration of the wide array of physical skills necessary for the actor. Using techniques derived from mime, clowning, sports, acrobatics, and improvisation, students will investigate their individual physical potential as well as their sense of creativity and imagination. *Prerequisite: THAC 101.*

TH/AC 120. Ensemble (4)
An intensive theatre practicum designed to generate theatre created by an ensemble with particular emphasis upon the analysis of text. Students will explore and analyze the script and its author. Ensemble segments include black theatre, Chicano theatre, feminist theatre, and commedia dell'arte. Audition may be required. A maximum of four units may be used for major credit. *Prerequisite: department stamp.*

TH/AC 122. Ensemble: Undergraduate Production (4)
Participation in a fully-staged theatre production directed by a M.F.A. or Ph.D. student for the Department of Theatre and Dance. Admission by audition only. A maximum of four units may be used for major credit. *Prerequisites: consent of the instructor; department stamp.*

TH/AC 123. Advanced Studies in Performance (4)
Participation in a fully-staged season production that is directed by a faculty member or guest for the Department of Theatre and Dance. Admission by audition only. A maximum of four units may be used for major credit. *Prerequisites: consent of the instructor; department stamp.*

TH/AC 126. Acting-Directing Process (4)
A studio class that investigates the relationship between the actor and the director. Working alongside

directors, students learn how to animate the writer's and director's vision on stage through status exercises and scene work while expanding their skills in the acting process. *Prerequisites: THAC 1, THAC 101, and consent of instructor.*

TH/DA–DANCE

TH/DA 1. Ballet, Level I Beginning (2)
An introduction to classical ballet principles, technique, and terminology. Develops the body for strength, flexibility, coordination, and artistic interpretation. Emphasis on developing a foundation in classical movement for continuation of ballet training. Historical origin of ballet will be discussed along with an introduction to the kinesiological principles of movement. *Prerequisite: none.* May be taken three times for credit.

TH/DA 2. Modern Dance I, Beginning (2)
Introduction to modern dance as a means of visual communication. Pattern variations analyzed in time, space, design, and kinetic sense. Movement exploration includes improvisation and composition. *Prerequisite: none.* May be taken three times for credit.

TH/DA 3. Jazz Dance I, Beginning (2)
Emphasis on technical skills, terminology, contemporary compositions, and introduction to the history of jazz dance. Explores specific rhythmic exercises, isolations, turns, locomotor combinations to a broad base of musical styles and variations. *Prerequisite: none.* May be taken three times for credit.

TH/DA 4. Pre-Ballet: Introduction to Ballet (2)
Designed for the novice, this course will focus on correct postural alignment and establish a basic foundation for the understanding of ballet movement vocabulary, terminology and form, and an introduction to exercises to develop muscles and coordination. *Prerequisite: none.*

TH/DA 11A. Theatrical Tap (2)
The study of theatrical tap dance. Various styles of tap—such as classical, rhythm and musical theatre will be introduced. Emphasis on rhythm, coordination, timing, and theatrical style. Includes basic through intermediate tap movement. *Prerequisite: none.*

TH/DA 11B. Theatrical Tap (2)
The further study of various styles of theatrical tap dance. Includes more intricate rhythms such as turns, pull-backs, pick-ups, and wings. More complex rhythm variations and choreographic composition will be introduced. *Prerequisite: THDA 11A or consent of instructor.*

TH/DA 11C. Theatrical Tap (2)
Includes more complicated rhythms and advanced principles of dance composition for the theatre. Improves on musical interpretation, performance quality and style. Will focus on individual performance and choreography. *Prerequisites: THDA 11A and THDA 11B or consent of instructor.*

TH/DA 16. Musical Theatre Dance B (2)
A continuation of the exploration of the historical development of musical theatre character dance forms covering the 1930s through the 1960s. Emphasizes composition and movement techniques of this rich period of pioneers and stylists. Choreography for film will be introduced. *Prerequisite: none.*

TH/DA 20. Dance Workshop (2)
The study of aesthetic examination of major choreographic works. Emphasis will be on formulating the creative process into a complete dance form. Projects in performance, production, choreography and directing. *Prerequisite: consent of the instructor.* May be repeated for credit.

TH/DA 25. Music for Dancers (4)
A course designed to teach the fundamentals of all forms of music to dance students. Topics include identifying rhythm, instrumentation, vocabulary, and the orchestration of time in space. Historical and contemporary forms will be analyzed utilizing both live and recorded music. *Prerequisite: none.*

TH/DA 101A-B-C. Ballet II–Intermediate (2-2-2)
Continued studio work in ballet technique and terminology. Emphasis on increasing strength, flexibility and balance, and interpretation of classical musical phrasing. Includes concepts of anatomy and physiology in relationship to ballet. *THDA 1 is prerequisite for THDA 101A. THDA 101A is prerequisite for THDA 101B and THDA 101B is prerequisite for THDA 101C or consent of instructor.* Series may be repeated once for credit.

TH/DA 102A-B-C. Ballet III–Advanced 1 (4-4-4)
Further emphasis on techniques, projection, terminology, and introduction to point work. Introduces historical ballet choreographic variations. Individual and group composition will be presented and aesthetic criticism applied. Text, film, and video used in depicting the historical evolution of ballet (Course materials fee: $50). *THDA 101C is a prerequisite for THDA 102A. THDA 102A is prerequisite for THDA 102B and THDA 102B is prerequisite for THDA 102C or consent of instructor.* Series may be repeated once for credit.

TH/DA 103A-B-C. Ballet IV–Advanced 2 (4-4-4)
Designed for students with advanced training and includes point work, pas de deux, classical and contemporary variations, and repertory works. Emphasis on increasing composition and performing skills. The aesthetics of ballet in Western and Non-Western cultures will be discussed. *THDA 102C is a prerequisite for THDA 103A. THDA 103A is prerequisite for THDA 103B and THDA 103B is prerequisite for THDA 103C or consent of instructor.* Series may be repeated once for credit.

TH/DA 110A-B-C. Modern Dance II–Intermediate (2-2-2)
Further development of movement as an expressive medium. Introduces the principles and elements of modern dance and their relationship to other art forms. Discussion of modern dance pioneers. *THDA 2B prerequisite for THDA 110A. THDA 110A is a prerequisite for THDA 110B and THDA 110B is prerequisite for THDA 110C, or consent of instructor.* Series may be repeated once for credit.

TH/DA 111A-B-C. Modern Dance III–Advanced 1 (4-4-4)
Emphasis is on the development of modern dance as an expressive art concept. Individual and group choreography will be explored and aesthetic concepts. Incorporates applied physiological principles of human movement. Discussion of modern and post-modern trends using text, video, and film. *THDA 110C is a prerequisite for THDA 111A. THDA 111A is a prerequisite for THDA 111B and THDA 111B is prerequisite for THDA 111C, or consent of instructor.* Series may be repeated once for credit.

TH/DA 112A-B-C. Modern Dance IV–Advanced 2 (4-4-4)
A continuation of advanced exploration of dance as an expression of artistic and social communication. Contemporary and historical choreographic styles will be reviewed. Advanced principles of composition and dance aesthetics will be discussed. *THDA 111C is a prerequisite for THDA 112A. THDA 112A is a prerequisite for THDA 112B and THDA 112B is prerequisite for THDA 112C, or consent of instructor.* Series may be repeated once for credit.

TH/DA 120A-B-C. Jazz Dance II–Intermediate (2-2-2)
Further development of technical skills, terminology, and intermediate rhythmic patterns. Emphasis includes historical and current trends, and general concepts of anatomy and physiology in relationship to movement. Theories of spatial forms and structure will be discussed. *THDA 3 is a prerequisite for THDA 120A. THDA 120A is a prerequisite for THDA 120B and THDA 120B is prerequisite for THDA 120C, or consent of instructor.* Series may be repeated once for credit.

TH/DA 121A-B-C. Jazz Dance III–Advanced 1 (4-4-4)
Techniques of body control, with a final performance focus. Development of movement theory as related to the performer. Application of constructive criticism to the performer utilizing small group and solo choreography. Includes discussions of jazz dance and its effect of social-cultural and human behavior. *THDA 120C is a prerequisite for THDA 121A. THDA 121A is a prerequisite for THDA 121B and THDA 121B is prerequisite for THDA 121C, or consent of instructor.* Series may be repeated once for credit.

TH/DA 122A-B-C. Jazz Dance IV–Advanced 2 (4-4-4)
Extensive study in the development of movement theory as related to the performer. Includes lectures on choreographic principles, compositional forms, constructive criticism, and the history of jazz as an American art form. *THDA 121C is a prerequisite for THDA 122A. THDA 122A is a prerequisite for THDA 122B and THDA 122B is a prerequisite for THDA 122C, or consent of instructor.* Series may be repeated once for credit.

TH/DA 130A. Studies in Performance–Winter Faculty and Student Dance Concert (2-4)
The in-depth study of a major dance production. Admission by audition only. *Corequisites: students must be concurrently enrolled in any level of THDA 1, 2, 3, 101, 102, 103, 110, 111, 112, 120 or 121; department stamp.*

TH/DA 130B. Studies in Performance–Spring Student Dance Concert (2-4)
The in-depth study of a major dance production; including choreography and/or performance. Admission by audition only. *Corequisite: students must be concurrently enrolled in any level of THDA 1, 2, 3, 101, 102, 103, 110, 111, 112, 120 or 121. Prerequisites: choreographers must also either have completed or be currently enrolled in THDA 141, 142, or 143; department stamp.*

TH/DA 131. Dance Repertory (2)
The study and aesthetic examination of major choreographic works created by dance faculty of the department or distinguished guest artists. A total of eight units of THDA 130 and THDA 131 may count towards major requirements. Audition is required. *Prerequisite: department stamp.*

TH/DA 132. Dances Of The World (4)
Course designed for in-depth study of the dance of a particular culture—Afro-Cuban, Spanish Balinese, Japanese, Latin, etc. Specific topic will vary from quarter to quarter (Course materials fee $20). *Prerequisite: upper-division standing.* May repeat once for credit if in a different topic.

TH/DA 133. Advanced Dance of the World (4)
Course designed to continue the in-depth study of the dance of a particular culture: Afro-Cuban, Spanish, Balinese, Japanese, Latin, etc. Specific topic will vary from quarter to quarter. This course is designed for the more advanced student and will emphasize the refinement of the various techniques. *Prerequisite: upper-division standing and THDA 132 or audition.* May be repeated once for credit.

TH/DA 140. Dance Improvisation (4)
Participants will learn improvisation methods as related to the aesthetic awareness of movement. Students will explore both structured and unstructured improvisation skills to expand their awareness of movement choices in time, space, and energy. *Prerequisite: none.*

TH/DA 141. Principles of Choreography (4)
Presents the concepts and elements of dance creation through studies, readings, discussions, and examination of theories. This course is the foundation of the fundamentals of dance composition. *Prerequisite: none.*

TH/DA 142. Choreography and Performance (4)
Theories and techniques of advanced choreographic problems exploring a range of performance options including multi-media collaborations using video, text, lighting, props, masks, dance/music improvisations, and environmental choreography and performance. *Prerequisite: none.* May be repeated once for credit.

TH/DA 143. Choreography for Dramatic Text (4)
Choreography problems in movement, style, and purpose will be explored through analysis of both historical and contemporary dramatic text. Emphasis will be placed on dance as a complement to verbal communication and a medium for non-verbal communication. *Prerequisite: THDA 1 or THDA 2 or THDA 3, or above, and THAC 1, or consent of instructor.*

TH/DA 151. Dance History–Ballet (4)
A study of ballet as a reflection of history from its origins and aesthetic development to its choreographic diversity of today. *Prerequisite: none.*

TH/DA 152. Dance History–Modern (4)
A study of modern dance as a reflection of history from its origins and aesthetic developments to its choreographic diversity of today. Reflections of the significant reactions of modern dance to social, economical, and cultural changes will be included. *Prerequisite: none.*

TH/DA 153. Dance History–Jazz Dance and Related Ethnic Studies (4)
A study of jazz dance and other related ethnic dance cultures as a reflection of history from their origins and aesthetic development to their choreographic intentions of today. Evidence of artistic fluctuation in social, economical, and cultural diversity will be included. *Prerequisite: none.*

TH/DA 154. Dance History: Special Topics (4)
An in-depth exposure to an important topic in dance history. Topics vary from quarter to quarter. May be taken up to three times for credit. *Prerequisite: upper-division standing.*

TH/DA 159. Dance Criticism and Aesthetics (4)
A historical analysis of aesthetic concepts related to dance and comparable visual arts. Critical writings on dance as a visual art will be studied from the renaissance to the present. *Prerequisite: upper-division standing or consent of instructor.*

TH/DA 160. Dance Movement Analysis and Injury Prevention Techniques (4)
This course is designed to provide the dancer with a muscular skeletal understanding of dance education. Analytic studies will concentrate on kinesthetic functions, training practices, nutrition, distribution of dance injuries, and results of poor training. *Prerequisite: upper-division standing or consent of instructor.*

TH/DA 163. Dance Theory and Pedagogy (4)
The study of theoretical aspects of dance movement including an analysis of movement concepts for all ages. Development of basic technique training in all forms, curriculum planning, social awareness, and problem solving. Fundamental elements of cognitive and kinetic learning skills. *Prerequisite: Level II in any dance form or consent of instructor.*

TH/DA 170. Dance Theatre Performance Lab (4)
A process of creating theatrical imagery based on the interaction of dancers with physical objects, such as scenic elements, costumes, and props. The resulting interdependence between movement and theatre elements will provide the stimulus for developing performance ideas. *Prerequisite: upper-division standing or consent of instructor.*

TH/DA 171. Movement Research (4)
Students will study images of anatomical alignment and use their bodies to translate those images into physical action. They will expand their movement potential, deepen their awareness of body language and alignment, and develop their dance coordination and technique. *Prerequisites: any of THDA 101B, 101C, 110A, 110B, or 110C; or consent of instructor.*

TH/DA 193. Dance Externship (1-12)
Assist in teaching and mentoring children in K-12 level schools as well as other venues throughout San Diego. Build skills in communication, teaching, problem solving, and positive motivational techniques. *Prerequisites: Technical level II; department stamp.* May be repeated once for credit.

TH/DA 195. Instructional Assistance (2 or 4)
Assist with instruction in undergraduate dance courses. Full description of duties will appear on the "application for Instructional Assistance." *Prerequisite: upper-division standing, 3.0 GPA, etc. (per CEP guidelines).*

TH/DA 197. Field Studies in Dance (1-12)
Designed for advanced students, this course significantly extends their knowledge of the theatre and dance through intensive participation in the creative work of a major professional theatre or dance company under the guidance of artists resident in those theatres or companies. Students will submit regular written evaluations each week of their ongoing field study. *Prerequisites: upper-division standing and consent of instructor required (e.g., "San Diego Dance Institute").* May be repeated once for credit.

TH/DE Theatre Design

TH/DE 1. Introduction to Design for the Theatre (4)
A survey of contemporary and historical concepts and practices in the visual arts of the theatre; studies in text analysis, studio processes and technical production; elementary work in design criticism, scale model making, and costume design. A course serving as an introduction to theatre design and production.

TH/DE 101. Theatre Process—Scenery (4)
A hands-on course develops craft skills and solution-finding process in design including script analysis, concept sketches, research, and scale model making. An exploration of fundamental ways of seeing and understanding visual design. *Prerequisite: THDE 1 or THPR 1 or consent of instructor.*

TH/DE 111. Theatre Process—Costumes (4)
The process of the costume designer from script analysis, research visualization of ideas, through the process of costume design. Lecture and demonstration labs parallel lecture material. This course is intended for those interested in a basic understanding of the costumer's process. No previous drawing or painting skills required. *Prerequisite: THDE 1.*

TH/DE 121. Theatre Process—Lighting (4)
One of three classes in theatre process. The course aims to develop basic skills in lighting design through practical projects, lab work and lecture. These emphasize collaboration, manipulating light and color, and developing craft skills. *Prerequisite: THDE 1 or THPR 3 or consent of instructor.*

TH/DE 130. Assistant Designer (2-6)
A production-oriented course that continues to introduce students to the fundamentals of design assisting. Laboratory format allows the student to work with faculty, graduate, or advanced undergraduate theatre designers, doing research, developing design concepts, and supporting the designer in a number of professional ways. *Prerequisites: THDE 1, any upper-division undergraduate theatre design class, THPR 1, 2, 3, 4, or 5; and, permission of instructor; department stamp.* May be taken twice for credit.

TH/DE 131. Special Topics in Theatre Design (4)
A course designed to expose the theatre design student to a variety of specialized topics that will vary from quarter to quarter. *Prerequisite: THDE 1 or consent of instructor.* May be taken three times for credit.

TH/DE 132. Undergraduate Mainstage Production: Design (4)
A course which will guide a student in a design assignment on the undergraduate mainstage production. Specialized topics dependent on the design requirements of the production. *Prerequisite: THDE 1 or consent of instructor.* May be taken two times for credit.

TH/DE 134. Advanced Undergraduate Mainstage Design (2-6)
A production-oriented course that allows the advanced student major design opportunities in costumes, lighting, scenery, or sound. Laboratory format allows the student to work with faculty members and professional shop personnel in accomplishing significant creative work. *Prerequisite: TH/DE 130, TH/DE 132, THPR 1, 2, 3, or 5; department stamp required.* May be taken twice for credit.

TH/DE 190. Major Project in Design/Theatre Production (4)
For the advanced design/production student. Concentration on a particularly challenging design or theatre production assignment, including such areas as assistant designer (scenery, lighting, or costumes), technical director, master cutter, or master electrician. May be repeated one time for credit. A maximum of eight units of major project study, regardless of area (design, directing, or stage management) may be used to fulfill major requirements. *Prerequisite: admission by consent of instructor only. See department for application form. May be taken two times for credit.*

TH/DR Directing/Choreography/Stage Management

TH/DR 101. Stage Management (4)
Discussion and research into the duties, responsibilities, and roles of a stage manager. Work to include studies in script analysis, communication, rehearsal procedures, performance skills, and style and concept approach to theatre. THGE 1, THAC 1, and THDE 1 recommended.

TH/DR 108. Text Analysis for Actors and Directors (4)
This is an introductory class in the process of understanding the play script. The class will focus on analyzing the story and the underlying dramatic structure in terms of dramatic action. Objectives, actions, choices, given circumstances, and character will be examined. *Prerequisite: upper-division standing or consent of instructor.*

TH/DR 111. Directing-Acting Process (4)
A studio class that investigates the fundamental skills a director needs to work with actors. Working with actors, students learn how to animate the text on stage through status exercises and scene work as they develop their skill in text work, staging, and dramatic storytelling. *Prerequisite: THDR 108 or THHS 10.*

TH/DR 190. Major Project in Directing (4)
For the advanced student in directing. Intensive concentration on the full realization of a dramatic text from research and analysis through rehearsal and into performance. A maximum of eight units of major project study, regardless of area (design, directing, or stage management) may be used to fulfill major requirements. See department for application. *Prerequisites: THDR 108, 111, and consent of instructor.* May be taken two times for credit.

TH/DR 191. Major Project in Stage Management (4)
For the advanced student in stage management. Intensive concentration on the full realization of a dramatic text, from research and analysis through rehearsal and final performance. A maximum of eight units of major project study regardless of area (design, directing, stage management, or playwriting) may be used to fulfill major requirements. See department for application. *Prerequisites: THPR 4, THPR 104, THDR 101, and consent of instructor.* May be taken two times for credit.

TH/GE Theatre General

TH/GE 1. Introduction to Theatre (4)
An introduction to fundamental concepts in drama and performance. Students will attend performances and learn about how the theatre functions as an art and as an industry in today's world. *Prerequisite: none.*

TH/GE 10. Theatre and Film (4)
Theatre and Film analyzes the essential differences between theatrical and cinematic approaches to drama. Through selected play/film combinations, the course looks at how the director uses actors and the visual languages of the stage and screen to guide and stimulate the audience's responses. *Prerequisite: none.*

TH/GE 11. Great Performances on Film (4)
Course examines major accomplishments in screen acting from the work of actors in films or in film genres. *Prerequisite: none.* May be taken three times for credit.

TH/GE 25. Public Speaking (4)
This course is designed to establish a clear understanding of the fundamentals of effective oral communication. The methodologies explore the integration of relaxation, concentration, organization, and clear voice and diction as applied to various public speaking modes. *Prerequisite: none.*

TH/GE 27. User-Friendly Shakespeare (4)
Do you get a puzzled or pained expression on your face when people mention Shakespeare? Try a congenial introduction to the world's greatest playwright from the perspective of performance. Film, live performance, and illuminating facts confront the so-called difficulties in an appreciation of the Bard. *Prerequisite: none.*

TH/GE 87. Freshman Seminar in Theatre and Dance (1)
Seminar on a topic in theatre or dance on a level appropriate for first-year students, conducted in an informal, small group setting limited to ten to twenty students. Topics will vary.

TH/GE 90. Undergraduate Seminar (1)
Discussion of various theatre topics.

TH/GE 108. Production (1)
The collaborative process from the rehearsal process through public performance. All participants will enroll in the same number of units with the director of theatre. *Prerequisite: none.*

TH/GE 123. Mary Poppins Meets Bladerunner (4)
A lecture class that examines significant historical and contemporary art direction/scenic design that effectively supports film narration in a unique manner. Highlights and video clips accompany each feature film presentation. (THDE 1 recommended.) *Prerequisite: upper-division standing.*

TH/GE 124. Cult Films: Weirdly Dramatic (4)
A select survey of eight to ten exceptional off-beat, frequently low-budget films from the last sixty years that have attained "cult" status. The mix includes Tod Browning's "Freaks" (1932) to John Water's "Pink Flamingos" (1973). Aspects of bad taste, cinematic irony, and theatrical invention will be highlighted. *Prerequisite: upper-division standing.*

TH/GE 125. Topics in Theatre and Film (4)
An in-depth exposure to an important individual artist or subject in theatre and/or film. Topics vary from quarter to quarter. *Prerequisite: upper-division standing or consent of instructor.*

TH/GE 130. Let There Be Light! (4)
An adventure-theory class investigating the power of light and color used in art, architecture, theatre, film, television and exploring its impact on students' lives. Students will perform research, submit papers, and create practical examples. No prior lighting/design skills required. *Prerequisite: none.*

TH/GE 195. Instructional Assistance (2 or 4)
Assist with instruction in undergraduate theatre courses. Full description of duties will appear on the "Application for Instructional Assistance." *Prerequisites: upper-division standing; 3.0 GPA; department stamp.* May be repeated for a total of 8 units.

TH/GE 196A. Honors Studies in Theatre (4)
This course will allow theatre honors students to explore advanced issues in the field of theatre. It will also provide honors students the opportunity to develop an honors thesis on the topic of their choice and begin preliminary work under faculty supervision. Department stamp required. Can be taken for a letter grade only. Other requirements are junior standing (ninety- plus units); 3.5 GPA up to graduation; 3.7 GPA in major; must have completed at least four upper-division theatre courses; recommendation of faculty member familiar with student's work.

TH/GE 196B. Honors Thesis in Theatre (4)
This course will provide honors candidates an opportunity to complete the research on and preparation of an honors thesis under close faculty supervision. Can be taken for a letter grade only. Other requirements are junior standing (ninety-plus units); 3.5 GPA overall up to point of graduation; 3.7 GPA in major; must have completed at least four upper-division theatre courses; recommendation of a faculty member familiar with student's work. Department stamp required.

TH/GE 197. Field Studies (1-12)
Designed for advanced students, this course significantly extends their knowledge of the theatre through intensive participation in the creative work of a major professional theatre, television, or film company under the guidance of artists resident in those theatres or companies. Students will submit regular written evaluations each week of their ongoing field study. *Prerequisites: consent of instructor, upper-division standing, and department stamp.* May be taken two times for credit.

TH/GE 198. Directed Group Studies (0-2-4)
Group studies, readings, projects, and discussions in theatre history, problems of production and performance, and similarly appropriate subjects. *Prerequisites: upper-division standing, 2.5 GPA, and consent of instructor.* May be repeated for a total of 12 units.

TH/GE 199. Special Projects (0-2-4)
Qualified students will pursue a special project in theatre history, problems of production and performance, and similarly appropriate topics. *Prerequisites: upper-division standing and consent of instructor, 2.5 overall GPA.*

TH/HS Theatre History

TH/HS 10. Introduction to Play Analysis (4)
An introduction to the fundamental techniques of analyzing dramatic texts. Focus is on the student's ability to describe textual elements and their relationships to each other as well as on strategies for writing critically about drama. *Prerequisites: none.*

TH/HS 11. History of Theatre 1: Classical to Renaissance (4)
An introduction to the plays, players, and places of Greek, Roman, and Renaissance theatre. Playwrights include Aeschylus, Sophacles, Euripides, Plautus, Shakespeare, Marlowe, Cervantes, and Lupe de Vega. Emphasis will be on the plays in performance. *Prerequisite: none.*

TH/HS 12. History of Theatre 2: Neoclassicism to Realism (4)
An introduction to the plays, players, and places of 17th, 18th, and 19th-century theatre. The course tracks the development of theatrical realism in acting, design, and playwriting. Playwrights include Molière, Racine, Sheridan, Goëthe, Beaumarchais, Ibsen, and Chekhov. The plays will be studied in the context of the theatre and culture in which they were first performed. *Prerequisite: none.*

TH/HS 13. History of Theatre 3: Symbolism to Postmodernism (4)
An introduction to the plays, players, and places of twentieth-century European and American theatre.

Playwrights include Jarry, Pirandello, Brecht, O'Neill, Genet, Beckett, Baraka, Shange, Fornes, and Hwang. Emphasis will be on the plays in performance. *Prerequisite: none.*

TH/HS 101. Topics in Dramatic Literature and Theatre History (4)
An in-depth exposure to an important individual writer or subject in dramatic literature and/or theatre history. Topics vary from quarter to quarter. Recent courses have included Modern French Drama, and the History of Russian Theatre. *Prerequisite: THHS 10 and either THHS 11 or 12 or 13 or consent of instructor.* May be taken three times for credit.

TH/HS 102. Masters of Theatre (4)
Focus on the artists of seminal importance in the theatre. Consideration will be given to theory and practice of the artist, with emphasis on theatrical realizations that can be reconstructed by integrated research. Examples of recent courses include Moliére, Fugard, and Strindberg. *Prerequisite: THHS 11 or THHS 12 or THHS 13 or consent of instructor.* May be taken three times for credit.

TH/HS 104. Italian Comedy (4)
Continuities and changes in Italian comedy from the Romans through the Renaissance and Commedia dell'arte to modern comedy. *Prerequisite: THHS 10 and THHS 11.*

TH/HS 105. French Comedy (4)
Masterpieces of French farce and comedy from the seventeenth century to the twentieth century studied their theatrical and cultural contexts. Readings include plays by Moliere, Marivauz, Beaumarchais, and Feydeau. *Prerequisite: THHS 10 and THHS 12.*

TH/HS 106. Brecht and Beyond (4)
Examination of the German playwright and director, Bertolt Brecht and of recent representative plays and performances from world theatre that reveal a creative assimilation of Brecht's influnce by artists including Peter Weiss, Heiner Muller, Augusto Boal, and Tony Kushner. *Prerequisite: THHS 10 and THHS 13.*

TH/HS 107. American Theatre (4)
In this course we will examine representative plays and playwrights who write about the "American" experience from a variety of historical periods and diverse cultural communities. Playwrights will include O'Neill, Glaspell, Miller, Williams, Hellman, Wasserstein, Wang, and Parks. *Prerequisite: THHS 10 and THHS 13.*

TH/HS 108. Luis Valdez (4)
In this course examines the works of Luis Valdez, playwright, director, screenwriter, film director, and founder of the Teatro Campesino. Readings include plays and essays by Valdez and critical books and articles about this important American theatre artists. *Prerequisite: THHS 10 and THHS 13.*

TH/HS 110. Chicano Dramatic Literature (4)
Focusing on the contemporary evolution of Chicano dramatic literature. This course will analyze playwrights and theatre groups that express the Chicano experience in the United States, examining relevant "actos," plays, and documentaries for their contributions to the developing Chicano theatre movement. (Cross-listed with Ethnic Studies 132.) *Prerequisite: THHS 11 or 12 or 13 or consent of instructor.*

TH/HS 111. Hispanic-American Dramatic Literature (4)
Course examines the plays of leading Cuban-American, Puerto-Rican, and Chicano playwrights in an effort to understand the experience of these Hispanic-American groups in the United States. (Cross-listed with Ethnic Studies 133.) *Prerequisite: THHS 11 or 12 or 13 or consent of instructor.*

TH/HS 112. Gay and Lesbian Themes in U.S. Latino Theatre (4)
This course examines plays by Latina and Latino playwrights that include characters who are gay, lesbian, bisexual, or transgendered. Readings include the plays as well as articles and essays about the plays, playwrights, and queer theory. *Prerequisites: THHS 10 and 13 or consent of instructor.*

TH/HS 113. Avant-Garde Theatre (4)
Innovations in theatre production and performance since the late nineteenth century, including the theatre of Artists and movements studied include Jarry, Appia, Constructivism, Expressionism, Dada cabaret, performance art, and dance theatre. Complements THHS 13's focus on dramatic innovation. *Prerequisite: THHS 10 and THHS 13 or consent of instructor.*

TH/HS 114. American Musical Theatre (4)
The class will explore this vital and unique theatre form by examining its origins, evolution components, and innovators. Special emphasis is placed on the process of adaptation and the roles of the director and choreographer. *Prerequisites: upper-division standing; THHS 10; THHS 13; or, consent of instructor.*

TH/HS 115. History and Theory of Directing (4)
Evolution of directing theory from 1850 to the present with reference to the work of internationally influential directors such as Saxe-Meiningen, Antoine, Stanislavski, Meyerhold, Brecht, and Brook, among others. *Prerequisite: THHS 10, 11, 12, and 13; and THAC 101.*

TH/HS 116. Old Myths in New Films (4)
The course will address the work of different writers each quarter, showing how their films derive from classic myths, legends, and traditions of a specific ethnic group. Authors discussed may include Kurosawa (Japanese), Herzog (German), Neil Jordan (Irish), and other moderns. *Prerequisite: upper-division standing or consent of instructor.* May be taken three times for credit.

TH/HS 117. Major's Seminar: Dramaturgy (4)
This course introduces students to the discipline of dramaturgy and prepares students to serve as dramaturges on theatrical projects. Material will include a survey of the origins, theories, and practical applications of dramaturgy in this and other countries. *Prerequisites: theatre majors only, THHS 11, 12, and 13; at least two UD THHS courses; consent of instructor.*

TH/HS 118. Dramaturgy in Practice (4)
Provides opportunities for students to undertake dramaturgy assignments for productions or as projects. Class meetings will create a mentoring atmosphere focused on the concrete, day-to-day process of dramaturging a project. *Prerequisites: theatre major, THHS 11, 12, and 13, two UD THHS courses; and THHS 17.*

TH/PR Practicum

TH/PR 1. Practicum–Scenery (4-6)
A production performance oriented course that introduces fundamentals of scenery construction and its theatrical operation. Laboratory format allows students to work through the scenery production process culminating in a crew assignment for a fully mounted theatrical production. *Prerequisite: department stamp required.*

TH/PR 2. Practicum–Costume (4-6)
A production performance oriented course that introduces fundamentals of costume construction and its integration into theatre operations. Laboratory format allows students to work through the costume production process culminating in a crew assignment for a fully mounted theatrical performance. *Prerequisite: department stamp required.*

TH/PR 3. Practicum–Lighting (4-6)
A production performance oriented course that introduces fundamentals of stage lighting or sound and its technical operation. Laboratory format allows a student to work through the lighting or sound production process culminating in a crew assignment for a fully mounted theatrical production. *Prerequisite: department stamp required.*

TH/PR 5. Practicum—Sound (4-6)
A production performance-oriented course that introduces fundamentals of theatre sound and its technical operation. Laboratory format allows a student to work through the sound production process culminating in a crew assignment for a fully mounted theatrical production. *Prerequisite: department stamp required.*

TH/PR 102. Advanced Theatre Practicum (4-6)
A production performance-oriented course that continues the development of costume, lighting, scenery, or sound production and introduces greater responsibilities in the laboratory format. Students serve as crew heads on major departmental productions or creative projects. *Prerequisites: THPR 1, 2, 3, or 5; permission of instructor; department stamp required.* May be taken for credit two times.

TH/PR 104. Advanced Practicum in Stage Management (4-6)
A production performance oriented course that continues the development of stage management skills and introduces greater responsibilities in the laboratory format. Students serve as either assistant stage managers on mainstage productions or stage managers on studio projects. *Prerequisites: THDR 101 and consent of instructor.* May be taken two times for credit.

TH/PW Playwriting

TH/PW 1. Introduction to Playwriting (4)
Beginning workshop in the fundamentals of playwriting. Students discuss material from a workbook which elucidates the basic principles of playwriting, do exercises designed to help them put those principles into creative practice, and are guided through the various stages of the playwriting process which culminates with in-class readings of the short plays they have completed.

TH/PW 101. Playwriting Workshop (4)
A workshop where students present their plays at various stages of development for group analysis and discussion. Students write a thirty-minute play which culminates in a reading. Also includes writing exercises designed to stimulate imagination and develop writing techniques. *Prerequisite: THPW 1 or consent of instructor.* May be taken two times for credit.

TH/PW 102. Playwriting Workshop II (4)
Advanced workshop where students study the full-length play structure and begin work on a long play. Students present their work at various stags of devel-

opment for group discussion and analysis. *Prerequisite: THPW 101 or consent of the instructor.* May be taken for credit two times.

TH/PW 104. Screenwriting (4)
Basic principles of screenwriting using scenario composition, plot points, character study, story conflict, with emphasis on visual action and strong dramatic movement. *Prerequisite: THPW 1.*

TH/PW 105. Writing for Television (4)
Basic principles of writing for television in the hour-long format. Course incorporates the study of sample episodes of current successful series for discussion. Analysis focuses on structure and character development. Students will create the concept and structure and write a television script. *Prerequisite: THPW 1.*

TH/PW 108. Topics (4)
Topics in playwriting, such as documentary theatre, adaptation and modernization, writing for media, for students who possess basic knowledge of playwriting. Admission by interview with instructor. *Prerequisites: THPW 1 and department stamp.*

TH/PW 190. Major Project in Playwriting/ Screenwriting (4)
For the advanced student in playwriting/screenwriting. This intensive concentration in the study of playwriting and/or screenwriting will culminate in the creation of a substantial length play. A maximum of eight units of major project study, regardless of area (Design, Directing, Stage Management, Playwriting) may be used to fulfill major requirements. Applicants must have completed the playwriting sequence, THPW 1, 101, and/or consent of instructor. See department for application form.

GRADUATE

TH/GR 200. Dynamics (1)
A daily program of physical, vocal, and speech exercises designed to prepare the student to move in a focused way into specific class areas with minimum amount of warm-up time. The exercises work on development of flexibility, strength, and coordination throughout the body. Strong emphasis is placed on physical and mental centering within a structured and disciplined approach to preparation. *Prerequisite: graduate standing.*

TH/GR 201. Stage Combat (2)
A study of the dramatic elements of stage violence, and practical work in developing the physical skills necessary to fully realize violent moments on the stage. At the core of the study is the process from text to convincing theatrical action. Physical work revolves around basic principles of energy, focus, and center inherent in unarmed and weapons combat. *Prerequisites: department approval and consent of instructor.*

TH/GR 202. Joint Stock (3)
The process of collaborative creation from idea to performance. *Prerequisites: graduate standing and consent of instructor.*

TH/GR 203. Seminar and Supervision for ArtsBridge Scholars (1)
A workshop to address the specific pedagogical requirements and techniques to be employed by students as ArtsBridge (outreach) Scholars and Mentors of ArtsBridge Scholars. Instructor will mentor the students on-site as well as in seminars. *Prerequisites: graduate standing and consent of instructor.*

TH/GR 204A. Text Analysis (4)
Topics to be covered will include: (1) concept of poetic language; lexical and syntactic analysis of dialogue; (2) the semantic context of dialogue; (3) thematic structure, from motive to themes; (4) the concept of dramatic character or hero; (5) dramatic narrative; (6) the material of drama; the relationship of myth and ritual to drama; (7) analysis versus interpretation; (8) practical applications. *Prerequisites: graduate standing and consent of instructor.*

TH/GR 205. Improvisation for the Theatre (3)
A course designed to introduce improvisational techniques to professional acting students. A variety of approaches to the art of improvisation will be presented and practiced, both serious and comic. Small and large group improvisations will be offered for participation. *Prerequisites: graduate standing and consent of instructor.*

TH/GR 206. Faculty Directed Production (4)
Faculty directed production, from the rehearsal process through public performance. All participants will enroll in the same section, the number of units depending upon degree of involvement. *Prerequisites: graduate standing and consent of instructor.*

TH/GR 207. Production (1)
The collaborative process from the rehearsal process through public performance. All participants will enroll in the same section, the same number of units. *Prerequisites: graduate standing and consent of instructor.*

TH/GR 209. Commedia and Comic Techniques (3)
A course designed to provide actors with tools, both physical and verbal, to play comedy. Included will be commedia del arte techniques, clown work, masks, circus techniques, mime, and scene work from comic scripts. *Prerequisites: graduate standing and consent of instructor.*

TH/GR 210A. Process I (4)
The actors focus on the nature of the acting process, using various exercises to stimulate imagination and inspire instinctual choices. Later work includes improvisational and imaginative experiences to explore character and text. The class culminates in intensive scene work chosen for the particular actor to meld the improvisational approach with scripted material. The class is a combination of both actors and directors so that a common language is developed. *Prerequisite: admission to the M.F.A. Theatre program.*

TH/GR 210B. Process I (4)
Intensive studio examination of realistic texts using improvisational and imaginative techniques to realistically based texts commonly from American theatre. *Prerequisites: THGR 210A and admission to the M.F.A. Theatre program.*

TH/GR 210C. Process I (4)
The intensive study of the dramatic and fictional work of Anton Chekhov and an actor's approach to that work. This course includes many of the techniques begun in earlier classes and applies them to this material. Also included is a study of Chekhov's short stories and plays, and involves adapting and staging these works. *Prerequisities: THGR 210B and admission to the M.F.A. Theatre program.*

TH/GR 211A-B-C. Speech for the Actor I (2-2-2)
Introduction of the principles of phonetics and articulation. Constant study and drill to prepare the actor for standard speech and flexibility. *Prerequisites: graduate standing and consent of instructor.*

TH/GR 212. Acting Practicum (2)
One-on-one laboratory workshop which examines practical applications of accents, speech and voice work, dialect, movement and combat work specific and ancillary to the productions in which the students have been cast. *Prerequisites: graduate standing and consent of instructor.*

TH/GR 213A-B-C. Movement for Theatre I (2-2-2)
An intensive studio course in the art of movement as a basis for theatre performance. Theory and practice of energy flow, weight, spatial focus, time consumption, and the shape factor. (S/U grades only.) *Prerequisites: 213A for B, 213B for C, graduate standing and consent of instructor.*

TH/GR 214A-B-C. Voice for Theatre I (2-2-2)
Voice exercises designed to "free the voice" with emphasis on diaphragmatic breathing, articulation exercises, and singing exercises. Course designed to broaden pitch, range, projection, and to expand the full range of potential characterizations. (S/U grades only.) *Prerequisites: 214A for B; 214B for C.*

TH/GR 219. Directing Process Studio (4)
Preparation, presentation, and discussion of representative scenes from various periods of dramatic literature. *Prerequisites: graduate standing and consent of instructor.*

TH/GR 220A-B-C. Process II: Classical Text (4,4,4)
An intensive studio examination of problems and potentials associated with the theatrical realization of the classical text. *Prerequisites: graduate standing and consent of instructor.*

TH/GR 221A-B. Speech for the Actor II (3-3)
Advanced work in phonetics and articulation. Intensive study of stage dialects to prepare actor for variety of roles. *Prerequisites: graduate standing; THGR 221A prerequisite for THGR 221B; consent of instructor.*

TH/GR 223A-B. Movement for Theatre II (2-2)
An advanced course in the art of movement for the theatre, building on the knowledge gained in Theatre 213. (S/U grades only.) *Prerequisite: 223A for B.*

TH/GR 224A-B. Voice for Theatre II (2-2)
Advanced voice training designed to help the actor fuse voice, emotion, and body into a fully realized reflection of the text. (S/U grades only.) *Prerequisite: 224A for B.*

TH/GR 225A-B. Singing for the Actor II (1-1)
Continuing vocal technique for the musical theatre. More complicated musical material investigated and prepared. *Prerequisite: graduate standing.*

TH/GR 227. Directing Assistantship (6-12)
Assisting faculty with productions off-campus. Perform research necessary for project. Assist with casting. Participate in design meetings. Observe and participate in rehearsal. Direct, if delegated to do so. *Prerequisite: graduate standing.*

TH/GR 228. Designing Assistantship (6-12)
Assisting faculty with productions off-campus. To draft some or all of the project design. To perform research, either visual, historical or technical. To create and maintain all production plans and paperwork records from pre-production through opening night. To organize the staff for focus and work calls. *Prerequisite: graduate standing.*

TH/GR 229. Theatre Externship (9-12)
Selected professional opportunities in repertory and commercial theatre, designed to engage the student in particular creative responsibilities under the guidance of master artist-teachers. *Prerequisites: graduate standing and consent of instructor.*

TH/GR 230. Acting Process III: Actors' Studio (4)
An advanced studio for graduate actors and directors, this work will explore a single text from the modern theatre under the direction of a master teacher-artist. Concentration will be on multiple possible modes of encountering a text, varieties of interpretation and performance realization, and the development of a theatre ensemble. *Prerequisites: graduate standing and consent of instructor.*

TH/GR 231. New Play Festival (8-12)
The workshopping and production of plays written by M.F.A. playwrights.

TH/GR 233. Acting for the Camera (1)
This course is designed to aid the actor in the transition from stage to film work. Examination of film production and its physical characteristics and the acting style needed for work in film and television. Students will rehearse and perform in simulated studio setting. *Prerequisites: graduate standing and consent of instructor.*

TH/GR 235. Singing for the Actor III (1)
Continuing vocal technique for the musical theatre. More complicated musical material investigated and prepared. *Prerequisite: graduate standing.*

TH/GR 239. Skills (4)
A unifying approach to acting skills (voice, movement, and speech) designed to result in providing the graduating actor with a daily regimen appropriate for professional work. *Prerequisites: graduate standing and consent of instructor.*

TH/GR 240. Directing Seminar (1-6)
A seminar focusing on the current directing projects of all graduate directing students. Depending upon individual student needs, the work may include play selection, historical or sociological research, and discussion of emerging directorial concepts, the rehearsal process, and post-production evaluation. *Prerequisites: graduate standing and consent of instructor.*

TH/GR 241. Directing—Site Specific (2-4)
A course designed to create theatre performance in non-theatrical settings. This will be done by using theatrical text in non-traditional settings or text specifically created for individual sites. *Prerequisites: graduate standing and consent of instructor.*

TH/GR 245. Directing Practicum (4)
Students enrolled in this course will work on productions in the function of a director. This will include staging, creative interpretation, blocking, etc. *Prerequisites: graduate standing and consent of instructor.*

TH/GR 250. Playwriting Seminar (4)
A seminar focusing on the current playwriting project of all graduate playwriting students. Work for each quarter is individually determined according to student needs, but may include exploration of an inceptive idea, development of a scenario or other structural work, and writing dialogue. Students present work to be discussed in class. May include group or individual playwriting exercises. *Prerequisite: graduate standing.*

TH/GR 251. Playwriting Practicum (3-6)
Creative writing project developing original scripts from outline to the final play. Plays may vary depending on the quarter, but will include writing of a realistic one-act, a nonrealistic one-act, a one-act documentary or dramatization of fiction, a full-length play. *Prerequisite: graduate standing.*

TH/GR 252. Dramaturgy Seminar (4)
The seminar will deal with all dramaturgical issues pertaining to departmental productions: production research, textual and analysis, translation, adaptation, rehearsal process, and critique. Concurrently with the dramaturgy issues of the given year, the seminar will discuss possible choices of plays for future production seasons. *Prerequisite: graduate standing.*

TH/GR 253. Dramaturgy Practicum (1-6)
Students enrolled in this course will work on productions in the function of a dramaturg. This will entail preparation of texts, research, participation at rehearsals, etc. *Prerequisite: graduate standing.*

TH/GR 256. Contemporary Plays (1-4)
A guided reading course focusing exclusively on very recent plays in an attempt to become aware of what is being written now. Course may be repeated for credit. *Prerequisite: graduate standing.*

TH/GR 257. Screenwriting (4)
Students will develop the concept for an original piece for television or film and will write the screenplay. Student work will be discussed in seminar at each phase of the development. *Prerequisites: graduate standing and 250.*

TH/GR 258. Dramatization and Adaptation (4)
Seminar will deal with dramatization and adaptation of literary texts for the purpose of theatrical production. The class will study some significant examples of such practice from the past, and, subsequently, students will develop their own projects of dramatization, adaptation, or modernization of texts. *Prerequisite: graduate standing.*

TH/GR 261. Theatre and Drama in Ancient Greece (4)
This class will deal mainly with the fifth-century theatre, drama, and related subjects of mythology and philosophy of art. *Prerequisite: graduate standing.*

TH/GR 270A-B-C. Design Studio I (4-4-4)
This course will focus on beginning-level problems in theatre design, including text analysis, research, conceptualization, and visual expression. Students will work on individual projects in lighting, costume, and scenic design. The course will include group critiques of completed designs and works in progress. 270A: Scenic Design (fall); 270B: Costume Design (winter); 270C: Lighting Design (spring). *Prerequisite: graduate standing and consent of instructor.*

TH/GR 271. Design Seminar (2)
A seminar focusing on all aspects of the design profession, including current projects of graduate design students. The work may also include portfolio presentations, research presentations, and guest lecturers. *Prerequisite: graduate standing.*

TH/GR 272. Master Class in Design (1-4)
Special topics in design taught in an intensive workshop format by professionals in the respective fields of study. Topics could include, but are not limited to, sound design techniques, new development in set design, AutoCAD drafting, or computers in design. *Prerequisites: graduate standing and admission to the M.F.A. program in Theatre.*

TH/GR 273. Fashioning the Body (4)
A survey/history of artistic and cultural stylistic change as embodied in clothing from early Western civilization to the contemporary period. *Prerequisite: graduate standing.*

TH/GR 274. Advanced Scenic Design (4)
This course explores advanced problems in scenic design through development and critique of creative class projects and production works-in-progress. *Prerequisite: graduate standing.*

TH/GR 275. Advanced Lighting Design (4)
Creative projects and topics in Lighting Design to develop the student's techniques and professional practices. Work to include studies in design research, concepts, psychophysical considerations, collaboration, professional procedures and systems, paperwork, and organization. Various scales of production projects will be addressed by the student for presentation and critique, and may be theoretical or productions in the departmental calendar. *Prerequisite: second- or third-year design students only; graduate standing.*

TH/GR 276. Advanced Costume Design (4)
Projects in costume design, emphasizing script analysis, research, conceptualization, and visual expression. Studio work includes costume rendering in various media for specific plays. *Prerequisite: graduate standing.*

TH/GR 277. Special Topics in Playwriting and Writing for other Media (4)
Topics will focus on various aspects of writing for the stage, television, and film. Topics will vary from quarter to quarter. *Prerequisite: graduate standing.*

TH/GR 278. Special Topics in Theatre Design: (1-6)
A course designed to expose the theatre design student to a variety of specialized topics, including millinery, pattern drafting and draping, scenic painting, model making, figure drawing, drafting, fitting, rendering. Topics will vary from quarter to quarter. *Prerequisite: graduate standing.*

TH/GR 279. Design Practicum (4)
This course covers the artistic, aesthetic and practical aspects of the designers work as they develop and execute the design toward a fully realized production. *Prerequisites: graduate standing and consent of instructor.*

TH/GR 280. Stage Management (1-4)
Discussion and research into the duties, responsibilities, and roles of a stage manager. Work to include studies in script analysis, communication, rehearsal procedures, performance skills, and style and concept approach to theatre. *Prerequisites: graduate standing and consent of instructor.*

TH/GR 281. Stage Management 2 (4)
A continuation of the introductory stage management course, to further explore the stage manager's process, focusing on the technical rehearsal period through the closing of a show. *Prerequisites: graduate standing, TH/GR 280, and consent of instructor.*

TH/GR 286. Special Topics in Stage Management (1-6)
A course for M.F.A. students in stage management. Topics will focus on various aspects of theatre administration, and advanced stage management including: Non-profit Theatre, Commercial Theatre, Advanced

Problems, Venues, Musicals/Dance, Production Management, Theatre Development, Business Problems, and Theatre Marketing. *Prerequisites: graduate standing and consent of instructor.*

TH/GR 288. Stage Management Seminar (4)
A weekly seminar in which all graduate stage managers participate. Includes discussions of problems encountered on current productions, paperwork, methodology, and production approaches. *Prerequisites: graduate standing and consent of instructor.*

TH/GR 290. Dramatic Literature and Theatre History Prior to 1900 (4)
Selected material from following topics: Classical Drama, Asian Drama,Medieval and Early Modern Drama, Shakespeare, European Drama 1600–1900. May be taken eight times as content varies. *Prerequisites: Ph.D. standing, consent of instructor.*

TH/GR 291. Dramatic Literature and Theatre History 1900 to the Present (4)
Selected material from following topics: European Theatre 1900–Present, American Theatre 1900–Present, Contemporary Theatre and Performance. May be taken eight times as content varies. *Prerequisites: Ph.D. standing, consent of instructor.*

TH/GR 292. Cultural and Critical Theory (4)
Selected material from following topics: Performance Theory, Dramatic Theory, Critical Theory, Cultural Studies. May be taken eight times as content varies. *Prerequisites: Ph.D. standing, consent of instructor.*

TH/GR 293. Directed Studies (4-12)
Individual or small group directed study.

TH/GR 294. Dissertation Research (4-12)
Research and preparation of doctoral dissertation.

TH/GR 295. Acting Practicum (2)
This course covers the artistic, aesthetic, and practical aspects of the actors' work as they develop and execute the character/role towards a fully realized production. *Prerequisites: graduate standing.*

TH/GR 296. Stage Management Practicum (4)
Taken each term by all graduate stage management students. The class focuses on the development of knowledge and skills necessary for the contemporary stage manager. Seminar format is augmented by lab work that may include departmental productions. *Prerequisite: graduate standing and consent of instructor.*

TH/GR 297. Thesis Research (2-12)
Thesis research for M.F.A. degree. (S/U grades only.) *Prerequisite: graduate standing.*

TH/GR 298. Special Projects (0-4)
Advanced seminar and research projects in theatre. (S/U grades only.) *Prerequisite: graduate standing.*

TH/GR 299. Thesis Project (2-12)
Specific projects in theatre individually determined to meet the developing needs, interests, and abilities of M.F.A. candidates. (S/U grades only.) *Prerequisite: graduate standing.*

TH/GR 500. Introduction to Apprentice Teaching (4)
This course, designed to meet the needs of the graduate students who serve as teaching assistants, includes analysis of texts and materials, discussion of teaching techniques, conducting discussion sections, formulation of topics and questions for papers, and examinations and grading. 2 units=25% TAship. 4 units=50% TAship. *Prerequisites: graduate standing and consent of the instructor.*

TH/GR 501. Teaching—Non Departmental (4)
Consideration of pedagogical applications in the teaching of literacy, historical and philosophical text at the undergraduate level. Pedagogical aids for the teaching of composition and supervised teaching in sections of undergraduate coruses such as the Revelle Humanities sequence and in the CAT programs of Sixth College. *Prerequisites: graduate standing and consent of instructor.*

Third World Studies

OFFICE: 3313 Literature Building,
Warren College, (858) 822-0377

Professors

Carlos Blanco-Aguinaga, Ph.D., *Spanish and Latin American Literature, Emeritus*
Jaime Concha, Ph.D., *Spanish and Latin American Literature*
Michael P. Montéon, Ph.D., *Latin American History*
Vicente L. Rafael, Ph.D., *Communication: Southeast Asian and Philippine Culture*
Edward Reynolds, Ph.D., *African History*
Rosaura Sanchez, Ph.D., *Spanish and Latin American Literature, Linguistics*
William Tay, Ph.D., *Chinese Literature, Emeritus*
Oumelbanine Zhiri, Ph.D., *Literature*

Associate Professors

Suzanne Brenner, Ph.D., *Anthropology*
Robert Cancel, Ph.D., *African and Caribbean Literature, Coordinator of Third World Studies*
Ann L. Craig, Ph.D., *Political Science*
Rosemary George, Ph.D., *Literature*
Max Parra, Ph.D., *Mexican Literature*
Marta E. Sanchez, Ph.D., *Latin American Literature*
Winnie Woodhull, Ph.D., *Literature*

The Third World Studies Program has three main objectives:

1. To provide an understanding of the Third World and its relationships to the West. In order to understand these relationships, it is necessary to study the historical context out of which the present relationships developed. For example, besides trying to understand what kind of society existed in Meso-America when the Spaniards arrived in 1520, the student must also have an understanding of the historical development in Europe which resulted in Spain's decision to seek wider trade abroad. There is insistence on both the similarities and differences which Third World societies have among themselves and the similarities and differences with Western societies.
2. To provide an interdisciplinary approach to the study of the Third World. The program is not conceived as being exclusively historically oriented nor as being predominantly a social science program, but rather one that integrates both the social sciences and the humanities.
3. To provide an understanding of the shifting economic and political nature of the countries designated as belonging to the "Third World," especially in light of the dramatic political and economic changes worldwide in the late 1980s and 1990s. To this end, our Third World Studies courses will, where appropriate, address and contextualize the history of the term "Third World" and its current applications in scholarship and the broader international media.

The Major Program

Students interested in Third World studies may focus on a theme, problem, or geohistorical area. A Third World studies program of study must be interdisciplinary. Students must choose course offerings from at least three disciplines (anthropology, economics, history, literature, political science, sociology, etc.).

A Third World studies major requires a minimum of *twelve* upper-division courses plus three lower-division courses from the Third World studies sequence (TWS 21, 22, 23, 24, 25, or 26). Students at Eleanor Roosevelt College may substitute up to two courses, Making of the Modern World 4 and 5, for two of the three-course lower-division sequence, but must take at least one course in the TWS 21–26 sequence. Selection of a specific concentration, discipline, or department should be determined in consultation with a Third World studies faculty member or program adviser.

Students majoring and minoring in Third World Studies are encouraged to experience their areas first-hand by studying abroad in any number of ways. Most convenient, depending on the area, is the University of California's Education Abroad Program, whereby students can gain

UC credit for study at foreign universities. This is especially convenient for students who cannot find sufficient courses at UCSD pertaining to such regions as the Caribbean and the Indian subcontinent. Moreover, Latin America, Asia, and Africa coursework is available in these regions through the Education Abroad Program and various programs available through other U.S. universities.

Double Major

Students interested in Third World studies as a double major must have at least *ten* upper-division courses that are unique to each departmental major. The courses required for Third World studies may cover one or more disciplines. Courses may focus on a theme or problem or on a geo-historical area. The remaining two courses may overlap with the other major requirements. Approval from *both* departments is required for overlaps. Students should consult a Third World studies faculty member or program adviser for approval of a major program.

Minor

A student may minor in Third World studies by selecting two courses from the lower-division Third World studies sequence (TWS 21, 22, 23, 24, 25, or 26) and five upper-division courses in disciplines dealing with the Third World.

Third World studies faculty members offer courses in the Departments of Anthropology, Communication, Literature, Political Science, Sociology, History, and in the Third World Studies Program. Appropriate courses in other departments may also be considered. Students should consult departmental and program listings for Third World area offerings.

COURSES

See listings also under the Departments of Anthropology, Communication, History, Literature, Political Science, and Sociology for other Third World area offerings.

LOWER-DIVISION

21-22-23-24-25-26. Third World Literatures (4-4-4-4-4-4)
An introduction to the cultures of various Third World countries through close reading of selected literary texts. TWS 21 focuses on African literature, TWS 22 deals with Latin American literature, TWS 23 examines Chinese literature, TWS 24 examines Caribbean literature, TWS 25 examines Middle Eastern literature, and TWS 26 examines literature of the Indian Subcontinent. Topics will vary each quarter. (F,W,S)

UPPER-DIVISION

132. Literature and Third World Societies (4)
This course will investigate novelistic and dramatic treatments of European society in the era of nineteenth-century imperialism, Third World societies under the impact of colonialism, and the position of national minorities inside the United States to the present day. Attention will center on the interplay between the aesthetic merits and social-historical-philosophical content of the works read.

135. Bilingualism: Research and Field Studies (4)
A study of sociolinguistic findings on bilingualism throughout the world and an evaluation of bilingual education theories. The students will also engage in surveys of local communities to assess bilingualism and educational needs of bilingual communities. *Prerequisite: upper-division standing.*

190. Undergraduate Seminars (4)
Seminars will be organized on the basis of topics with readings, discussions, and papers. Specific subjects to be covered will change each quarter depending on particular interest of instructors or students. May be repeated for credit.

197. Field Work (4)
In an attempt to explore and study some unique processes and aspects of community life, students will engage in research in field settings. Topics to be researched may vary, but in each case the course will provide skills for carrying out these studies.

198. Directed Group Studies (2 or 4)
Directed group study on a topic or in a field not included in the regular department curriculum, by special arrangement with a faculty member. *Prerequisite: upper-division standing.*

199. Independent Study (2 or 4)
Tutorial, individual guided reading and research projects (to be arranged between student and instructor) in an area not normally covered in courses currently being offered in the department. (P/NP grades only.) *Prerequisites: upper-division standing and consent of instructor.* (F,W,S)

Third World Studies offerings in other departments:

Anthropology: Regional

ANRG 104. Traditional African Societies and Cultures

ANRG 117. Gender Across Cultures

ANRG 134. The Cultures of Mexico

ANRG 137. Societies and Cultures of Melanesia

ANRG 162. Peoples of the Middle East

ANRG 170. Traditional Chinese Society

ANRG 173. Chinese Popular Religion

ANRG 182. Ethnography of Island Southeast Asia

Communication and Culture

COCU 179. Colonialism and Culture

History

HIAF 110. History of Africa to 1880

HIAF 111. Modern Africa since 1880

HIAF 120. History of South Africa

HIAF 130. African Society and the Slave Trade

HIAF 140. Economic History of Africa

HIAF 160. Special Topics in the Economic History of Africa

HIAF 161. Special Topics in African History

HIEA 112. Japan: From the Mid-Nineteenth Century Through the U.S. Occupation

HIEA 113. The Fifteen-Year War in Asia and the Pacific

HIEA 123. Food in Chinese History

HIEA 130. History of the Modern Chinese Revolution: 1800–1911

HIEA 131. History of the Modern Chinese Revolution: 1911–1949

HIEA 132. History of the People's Republic of China

HIEA 137. Women and Family in Chinese History

HILA 100. Latin America: Colonial Transformation

HILA 101. Latin America: The Construction of Independence 1810–1898

HILA 102. Latin America in the Twentieth Century

HILA 105. South America: Labor, Coercion, and Society in the Nineteenth Century

HILA 107. State and Society in Nineteenth- and Twentieth-Century Latin America

HILA 112. Economic and Social History of Andean Region

HILA 113. Lord and Peasants in Latin America

HILA 114. Social History of Colonial Latin America

HILA 115. The Latin American City: A History

HILA 116. Encounter of Two Worlds: Early Colonial Latin America

HILA 117. Indians, Blacks, and Whites: Family relations in Latin America

HILA 120. History of Argentina

HILA 121. History of Brazil

HILA 122. Cuba: From Colony to Social Republic

HILA 123. The Incas and Their Ancestors

HILA 131. A History of Mexico

HILA 132. A History of Copntemporary Mexico

HILA 160. Topics in Latin America Colonial History: 1500–1820

HILA 161. History of Women in Latin America

HILA 162. Special topics in Latin America

HILA 166. Cuba: From Colony to Socialist Republic

HINE 114. History of the Islamic Middle East

Literature

English

LTEN 135. Twentieth-Century Literature from the Indian Subcontinent

LTEN 188. Contemporary Caribbean Literature

LTEN 189. Twentieth Century Postcolonial Literatures

Portuguese – (texts read in Portuguese)

LTPR 130. Brazilian Literature

Spanish – (texts read in Spanish)

LTSP 130B. Development of Latin American Literature

LTSP 131. Spanish American Lit: The Colonial Period

LTSP 132. Spanish American Lit: 19th Century

LTSP 133. Spanish American Lit: 20th Century

LTSP 134. Argentine Literature

LTSP 135. Mexican Literature

LTSP 136. Peruvian Literature

LTSP 137. Caribbean Literature

LTSP 140. Spanish-American Novel

LTSP 141. Spanish-American Poetry

LTSP 142. Spanish-American Short Story

LTSP 143. Spanish-American Essays

LTSP 144. Spanish-AmericanTheatre

LTSP 163. Spanish Language in Spanish-American Literature

LTSP 172. Indigenista Themes in Spanish-American Literature

LTSP 173. Problems in Spanish and Spanish-American Literary History

Literatures of the World (texts read in English)

LTAF 110. African Oral Literature

LTAF 120. Literature and Film of Modern Africa

LTAM 110. Latin American Literature in Translation

LTAM 120. Mexican Literature in Translation.

LTEA 100A. Classical Chinese Poetry in Translation

LTEA 100B. Modern Chinese Poetry in Translation

LTEA 100C. Contemporary Chinese Poetry in Translation

LTEA 110B. Modern Chinese Fiction in Translation

LTEA 110C. Contemporary Chinese Fiction in Translation

LTEA 136. Special Topics in Japanese Literature

LTWL 140. Novel and History in the Third World

Music

MUS 126. Introduction to Oral Music

Political Science

POLI 130B. Politics in the People's Republic of China

POLI 130H. Vietnam: The Politics of Intervention

POLI 134B. Politics in Mexico

POLI 134C. Politics in Mexico: Research Seminar

POLI 134D. Selected Topics in Latin American Politics

POLI 134G. Politics in the Andes

POLI 134I. Politics in the Southern Cone of Latin America

POLI 134N. Politics in Central America

POLI 134P. Organizing Women in Latin America

POLI 134Q. Organization, Resistance, and Protest in Latin America

POLI 144AA. Politics in the International Economic Order

POLI 144AB. Selected Topics in International Political Economy

POLI 145B. Conflict and Cooperation in International Politics

POLI 146A. The U.S. and Latin America: Political and Economic Relations

POLI 150A. Politics of Immigration

Sociology: D

SOCD 133. Comparative Sex Stratification

SOCD 151. Comparative Race and Ethnic Relations

SOCD 158. Islam in the Modern World

SOCD 158J. Religion and Ethics in China and Japan

SOCD 179. Social Change

SOCD 185. Sociology of Development

SOCD 187. African Societies through Film

SOCD 188A. Community and Social Change in Africa

SOCD 188B. Chinese Society

SOCD 188D. Latin America: Society and Politics

SOCD 188J. Change in Modern South Africa

Students wishing to include additional related courses from these and other departments should consult a Third World studies adviser.

Thurgood Marshall College

Honors Program and Special Courses

OFFICE: Provost, Thurgood Marshall College Administration Building

The Thurgood Marshall College Honors Program is designed to address one of the greatest responsibilities and challenges of public higher education: the education of students of exceptionally high academic achievement. The program provides the organization and the environment within which students are encouraged to pursue individual excellence.

Honors activities and events are designed to introduce Thurgood Marshall students to the excitement of pioneering research and innovative scholarship in all disciplines at UCSD and to create opportunities for discussion on public issues with locally and nationally known figures. This happens primarily through the honors seminar, offered every quarter, and open to all class levels of honors students. Also, honors students enjoy a relaxed and informal evening with the provost.

To qualify for the honors program, incoming freshmen must have achieved an evaluated high school GPA of 3.8 or better, and mathematical SAT score of 650 and verbal SAT score of 710 or higher. Continuing UCSD and transfer students are eligible upon successful completion of at least twelve graded units with a 3.7 or better cumulative GPA. All honors students must maintain a 3.50 or better cumulative GPA.

Thurgood Marshall College annually recognizes superior achievement. The Provost Award is presented at commencement to a graduating senior who is recognized for outstanding academic achievement and breadth of scholarship. In addition, students may be eligible for universitywide and departmental honors, Provost Honors, Thurgood Marshall College Honors, Phi Beta Kappa membership, and participation in small honors classes in science.

Public Service Minor

Thurgood Marshall College sponsors the Public Service Minor at UCSD, which encourages students to understand the history and practices of public service and to participate in the development of civic skills. This minor is open to all UCSD students in good standing. Please see "Public Service Minor" in the departmental listings.

COURSES

10. Thurgood Marshall College Methods of Inquiry (2)
In this course, students learn analytical thinking strategies routinely used by professional scholars. Each student applies strategies from the materials presented in lectures and reading assignments to his or her current course work. *Prerequisite: concurrent enrollment in two lecture courses.* (P/NP only.)

15. Introduction to Public Service in America (4)
This course is designed to study, discuss, and analyze the history and current role of public service in the United States. Students will be introduced to the different roles held by the three sectors of the American economic structure (government, business, and nonprofit/public service) with opportunity to provide a critical analysis of those roles within American society.

20. Thurgood Marshall College Honors Seminar (1)
Weekly seminar conducted by UCSD faculty and distinguished guest lecturers on topics related to the core curriculum: diversity, justice, and imagination. (P/NP only.)

90. Undergraduate Seminar (1)
These seminars are designed to expose undergraduate students, especially freshmen and sophomores, to exciting research conducted by UCSD faculty. *Prerequisite: none.* (P/NP only.)

199. Marshall College Special Project (1–4)
Individual, independent research, or creative work intended to satisfy Marshall College graduation requirement. Designated for Marshall College students, topics are supervised by Marshall faculty in association with the honors seminar and honors projects. A written application describing the project is required. See Office of the Provost. *Prerequisites: upper-division students with 2.5 GPA and 90 units and approval of the provost or faculty designee. Honors standing required for honors projects.* (P/NP only)

UC San Diego Washington Program (UCDC)

Career Service Center, Room 112
http://career.ucsd.edu/sa/UCDC.shtml/
http://www.ucdc.edu

Since 1997, the UC San Diego Washington Center has provided students an opportunity to intern in the nation's capital while continuing their academic coursework. The program is open to all students who have completed ninety units toward graduation with a 2.5 grade-point average. Students earn fourteen units of academic credit, continue to be registered full time, and fulfill university residency requirements.

Students maintain financial aid eligibility; the amount can be adjusted to reflect the additional costs of the program. In addition, eligible students are considered for the University of California President's Washington Scholarship Program. Students live in the new University of California Washington Center, located in the heart of Washington, D.C.

Internship—Students work twenty-four hours per week as interns in federal agencies, interest groups, trade associations, the national news media, museums, research institutions, or in other organizations related to policy, politics, science, and culture and geared to the interests and objectives of individual students. *Political Science 197I:* six units of academic credit.

Research Seminar—Drawing on the internship experience, each student participates in a seminar and undertakes an independent research project. *Political Science 194* (or depending on the student's major, one of the cross-listed equivalents): four units of academic credit.

Elective Course—Each student also enrolls in one upper-division seminar course at the Washington Center. These courses are taught by the different campuses' resident faculty and change each quarter. Typically they include a mix of political science, international relations, other social sciences, history, and the arts and humanities. In addition to regular instruction, these seminars may take advantage of the Washington locale and often include guest speakers and field work activities.

Urban Studies and Planning

OFFICE: Social Science Building, Room 315
www.usp.ucsd.edu

Faculty

Amy Bridges, Ph.D., *Professor, Political Science*
Barbara Brody, M Public Health, *USP Lecturer/FPM*
Shalanda Dexter-Rogers, Ph.D., *Assistant Professor, Ethnic Studies*
Steven P. Erie, Ph.D., *Professor, Political Science, Director of USP*
April Linton, Ph.D., *Acting Assistant Professor, Sociology*
Isaac Martin, Ph.D., *Assistant Professor, Sociology*
Natalia Molina, Ph.D., *Assistant Professor, Ethnic Studies*
Becky Nicolaides, Ph.D., *Associate Professor, History*
Keith Pezzoli, Ph.D., *Lecturer, Urban Planning, USP Supervisor of Field Studies*
Lisa Sun-Hee Park, Ph.D., *Assistant Professor, Ethnic Studies*

Affiliated Faculty

Erik Bruvold, *USP Lecturer*
Mirle Bussell Rabinowitz, Ph.D., *Urban Planning, USP Lecturer*
Gary Fields, Ph.D., *Assistant Professor, Communication*
Carlos Graizbord, M Architecture, *USP Lecturer*
Zoltan Hajnal, Ph.D., *Assistant Professor, Political Science*
James Holston, Ph.D., *Associate Professor, Anthropology*
Thad Kousser, Ph.D., *Assistant Professor, Political Science*
Richard Marciano, Ph.D., *San Diego Supercomputer Center, Specialist*
Hugh (Bud) Mehan, Ph.D., *Professor, Sociology/TEP*
Michael Parrish, Ph.D., *Professor, History*
David Pellow, Ph.D., *Associate Professor, Ethnic Studies*
Abraham Shragge, Ph.D., *Lecturer, History*
Mike Stepner, *USP Lecturer*
Kenneth E. Sulzer, Ph.D., *USP Lecturer*
Michelle White, Ph.D., *Professor, Economics*
Ilya Zaslavsky, Ph.D., *San Diego Supercomputer Center, Assistant Research Scientist*

The Urban Studies and Planning Program

The great majority of U.S. citizens, and a growing proportion of people throughout the world, live in cities. Cities provide the environment in which people work, learn, play, and make decisions together. Local governments make critical interventions in the quality of life. At the same time, the cities of the world are increasingly linked in a global economic system, making diverse contributions to the international division of labor.

Urban studies and planning is an interdisciplinary program providing students with a variety of perspectives for understanding the development, growth, and culture of cities and the communities within them. Course work introduces students to the ways different disciplines understand cities and the societies of which they are a part. Upper-division requirements educate students about the parameters within which urban choices are made.

One of the outstanding features of the Urban Studies and Planning Program is the upper-division research requirement. During a two-quarter sequence designed to be taken in the fall and winter of the senior year, all USP majors are guided through a research internship and writing process. The upper-division field studies sequence allows students to work on specific policy projects in the San Diego region. Eligible students may choose to enroll in USP 190 in the spring to write an honors thesis. The honors option is an opportunity to do advanced research and writing that builds on work already completed in the senior sequence.

Urban studies and planning is an undergraduate community of students with diverse interests and goals. After graduation some majors pursue

graduate work in social science disciplines. Others pursue graduate study in public policy, law, planning, or architecture. Urban studies has always also attracted students interested in medicine and public health issues, who continue to study in these areas at schools of medicine or public health. Urban studies and planning provides students with a solid liberal arts background for graduate study or for professional work in a number of fields. Many students find employment opportunities through their field work placement. More generally, graduates of urban studies and planning will have the analytic skills to think clearly and act creatively about the problems and prospects of the urban environment.

The Urban Studies and Planning Major

A bachelor of arts degree in urban studies and planning will be given to students who satisfactorily complete the general-education requirements of Muir, Revelle, Marshall, Warren, Roosevelt, or Sixth College in addition to the urban studies and planning courses described below. The undergraduate program in urban studies and planning requires a three-quarter lower-division sequence in urban studies; Political Science 30; and twelve courses in upper-division urban studies and planning. *Students are encouraged to complete the lower-division prerequisites before they enroll in the upper-division courses.*

In accordance with campus academic regulations, courses used to satisfy the major cannot be applied toward a minor, although some overlap is allowed for double majors. All lower-division and upper-division requirements must be taken for a letter grade. A 2.0 grade-point average is required in the major, and students must earn at least C– in each course used for the major. Transfer students should see the USP student affairs adviser to determine whether courses taken elsewhere satisfy USP program requirements. No more than one special studies course, USP 198 or USP 199, will be accepted to count towards the major.

Lower-Division Requirements

Students majoring in urban studies and planning must complete the introductory sequence:

USP 1. History of U.S. Urban Communities (4)

USP 2. Urban World System (4)

USP 3. The City and Social Theory (4)

and

Political Science 30. Political Inquiry (4)
(Psychology 60, Introduction to Statistics or Sociology L60, The Practice of Social Research may be substituted for Political Science 30.)

Upper-Division Requirements

The upper-division requirements in urban studies and planning are:

1. three foundation courses
2. one research methods course to be taken junior year
3. six upper-division elective courses
4. two senior sequence courses of field work and internship

FOUNDATION COURSES

Foundation courses provide the conceptual tools for the major. Students are to choose three of:

USP 102. Urban Economics (Economics 135) (4)

USP 103. U.S. Cities in the Twentieth Century (HIUS 148) (4)
(USP 165/HIUS 147, History of the American Suburb may be substituted for USP103.)

USP 104. Ethnic Diversity and the City (Ethnic Studies 105) (4)

USP 105. Urban Sociology (Sociology C/153) (4)

USP 107. Urban Politics (Political Science 102E) (4)
(USP 113, Politics & Policymaking in Los Angeles may be substituted for USP 107.)

USP 124. Land Use Planning (4)
(USP 173, History of Urban Planning and Design may be substituted for USP 124.)

RESEARCH METHODS COURSES

Students are to choose one course of:

USP 129. Research Methods: Studying Racial and Ethnic Communities (Ethnic Studies 190) (4)

USP 130. Field Work in Racial and Ethnic Communities (Ethnic Studies 107) (4)

USP 192. GIS for Urban Community Planning (4)

USP 193. San Diego Community Research (4)

Sociology A/104. Field Research: Methods of Participant Observation

SENIOR SEQUENCE REQUIREMENT

In their senior year, all students must complete the senior sequence, USP 186 Field Work in the fall, and USP 187 Internship in the winter. These courses must be taken IN ORDER. The sequence develops each students ability to: (1) critically review others' research, (2) formulate interesting research questions of their own, (3) design an original research project and investigative strategy, (4) conduct research, and (5) analyze, interpret, and write up findings. The final requirement of USP 186 is a research proposal. By the end of USP 187 each student must complete a Senior Research Project.

Because the senior sequence includes an internship, no other internship or field placement will be counted towards the major.

USP 186. Urban Fieldwork Seminar (6)

USP 187. Urban Studies Internship (6)

HONORS IN URBAN STUDIES AND PLANNING

Candidates for Honors in Urban Studies and Planning are required to take USP 190 Senior Seminar, in which students write a senior thesis. Prerequisites for enrolling in USP 190 are a minimum 3.5 GPA in the major, senior standing, USP 186 and 187, and consent of instructor. Majors who plan to write a senior thesis in USP 190 must declare their intent in USP 186.

USP 190. Senior Honors Seminar (4)

UPPER-DIVISION ELECTIVE COURSES

Students are encouraged to pick an "area of concentration," and choose upper-division electives listed under that cluster. Students may also define their own "area of concentration" and design an appropriate curriculum drawn from courses offered by USP and other related departments. USP 199 Independent Study taken for pass/no pass will count for one USP upper-division elective course.

Urban/Regional Policy and Planning

USP 101/Political Science 160AA. Introduction to Policy Analysis

USP 102/Economics 135. Urban Economics

USP 107/Political Science 102E. Urban Politics

USP 109/Political Science 103A. California Government and Politics

USP 110/Political Science 102J. Advanced Topics in Urban Politics

USP 111/Political Science 102JJ. Field Research in Urban Politics

USP 112/Political Science 166F. The American Welfare State

USP 113/Political Science 103B. Politics and Policymaking in Los Angeles

USP 115. Politics and Policymaking in San Diego

USP 124. Land Use Planning

USP 133/Sociology C/152. Social Inequality and Public Policy

USP 137. Housing and Community Development Policy and Practice

USP 171. Sustainable Development

USP 172. Planning/Policy-making: U.S.-Mexican Border Region

USP 173. History of Urban Planning and Design

USP 174. Regional Governance and Planning Reconsidered

USP 180. Transportation Planning

USP 192. GIS for Urban and Community Planning

USP 193. San Diego Community Research

Anthropology (ANBI) 132/Biology (BIEB) 176. Conservation and the Human Predicament

Economics 116. Economic Development

Economics 130. Public Policy

Economics 131. Economics of the Environment

Economics 139. Labor Economics

Economics 150. Economics of the Public Sector: Taxation

Economics 151. Economics of the Public Sector: Expenditures

Economics 155. Economics of Voting and Public Choice

Economics 179. Decisions in the Public Sector

Envi 102. Selected Topics in Environmental Studies

Envi 130. Environmental Issues: Social Sciences

Political Science 160AB. Introduction to Policy Analysis

Political Science 162. Environmental Policy

Political Science 168. Policy Assessment

Sociology C/121. Economy and Society

Sociology C/155. The City of San Diego

Sociology C/180. Social Movements and Social Protest

Sociology D/179. Social Change

Urban Design/Built Environment

USP 103/History (HIUS) 148. American Cities in the Twentieth Century

USP 124. Land Use Planning

USP 137. Housing and Community Development Policy and Practice

USP 139. Race, Gender and Urban Planning

USP 165/History (HIUS) 147. History of the American Suburb

USP 171. Sustainable Development

USP 172. Planning/Policy-making: U.S.-Mexican Border Region

USP 173. History of Urban Planning and Design

USP 174. Regional Governance and Planning Reconsidered

USP 179. Urban Design, Theory, and Practice

USP 180. Transportation Planning

USP 192. GIS for Urban and Community Planning

USP 193. San Diego Community Research

Envi 102. Selected Topics in Environmental Studies

Envi 110. Environmental Law

Envi 130. Environmental Issues: Social Sciences

Ethnic Studies 103. Environmental Racism

Ethnic Studies 104. Race, Space, and Segregation

History (HIUS)137. The Built Environment in the Twentieth Century

Political Science162. Environmental Policy

Health, Social Services and Education

USP 101/Political Science 160AA. Introduction to Policy Analysis

USP 112/Political Science 166F. The American Welfare State

USP 133/Sociology C/152. Social Inequality and Public Policy

USP 143. The U.S. Health Care System

USP 144. Environmental and Preventive Health Issues

USP 145. Aging-Social and Health Policy Issues

USP 147. Case Studies in Health Care Programs/Poor and Underserved Populations

Economics 130. Public Policy

Economics 138A-B. Economics of Health

Economics 139. Labor Economics

Economics 150. Economics of the Public Sector: Taxation

Economics 151. Economics of the Public Sector: Expenditures

Economics 155. Economics of Voting and Public Choice

Economics 179. Decisions in the Public Sector

Ethnic Studies 142. Medicine, Race, and the Global Politics of Inequality

Ethnic Studies 163. Leisure in Urban America

Philosophy 163. Bio-Medical Ethics

Political Science 117. Violence and Social Order

Political Science 168. Policy Assessment

Psychology 104. Introduction in Social Psychology

Psychology 186. Psychology and Social Policy

Sociology B/112. Social Psychology

Sociology B117/TEP117. Language, Culture, and Education

Sociology C/123. Sociology of Work

Sociology C126/TEP 126. Social Organization of Education

Sociology C/132. Gender and Work

Sociology C/135. Medical Sociology

Sociology C/136A. Sociology of Mental Illness: An Historical Approach

Sociology C/136B. Sociology of Mental Illness in Contemporary Society

Sociology C/141. Crime and Society

Sociology C/159. Special Topics in Social Organizations and Institutions

TEP 130. Introduction to Academic Mentoring of Elementary/School Students

Urban Diversity

USP 104/Ethnic Studies 105. Ethnic Diversity and the City

USP 112/Political Science 166F. The American Welfare State

USP 129/Ethnic Studies 190. Research Methods: Studying Racial and Ethnic Communities

USP 130/Ethnic Studies 107. Field Work in Racial and Ethnic Communities

USP 132/Ethnic Studies 188. African Americans, Religion, and the City

USP 135/Ethnic Studies 129. Asian and Latina Immigrant Workers in the Global Economy

USP 139. Race, Gender and Urban Planning

Anthropology (ANRG) 114. Urban Cultures in Latin America

Ethnic Studies 106. Ethnoracial Tranformations of US Communities

Ethnic Studies 118.Contemporary Immigration Issues

Ethnic Studies 121. Contemporary Asian-American History

Ethnic Studies 123. Asian-American Politics

Ethnic Studies 131/History (HIUS) 159. Social and Economic History of the Southwest II

Ethnic Studies 151. Ethnic Politics in America

Ethnic Studies 160. Black Politics and Protest 1885–1941

Ethnic Studies 161. Black Politics and Protest Since 1941

Ethnic Studies 182/History (HIUS) 165. Segregation, Freedom Movements, Crisis 20th Century

Ethnic Studies 184. Black Intellectuals in the 20th Century

History (HILA) 115. The Latin American City, a History

History (HILA) 121. History of Brazil

History (HIUS) 114. California History

History (HIUS) 117. History of Los Angeles

History (HIUS) 180/Ethnic Studies 134. Immigration and Ethnicity in Modern American Society

Political Science 100H. Race and Ethnicity in American Politics

Political Science 100J. Race in American Political Development

Political Science 150A. Politics of Immigration

Political Science 150B. Politics of Immigration

Sociology A/100. Classical Sociological Theory

Sociology A/104. Field Research: Methods of Participant Observation

Sociology C/139. Social Inequality: Class, Race, and Gender

Sociology C/144. Forms of Social Control

Sociology C/148. Political Sociology

Sociology C/148L. Inequality and Jobs

Sociology D/151. Comparative Race and Ethnic Relations

Cities in Historical and Comparative Perspectives

USP 103/History (HIUS) 148. American Cities in the Twentieth Century

USP 105/Sociology C/153. Urban Sociology

USP 107/Political Science 102E. Urban Politics

USP 112/Political Science 166F. The American Welfare State

USP 138. Cities in the Developing World

USP 158/Anthropology (ANRG) 118. City and Society in Anthropological Theory

USP 165/History (HIUS) 147. History of the American Suburb

USP 166. History of San Diego

USP 173. History of Urban Planning and Design

Anthropology (ANRG) 114. Urban Cultures in Latin America

Economics 116. Economic Development

Ethnic Studies 121. Contemporary Asian-American History

Ethnic Studies 131/History (HIUS) 159. Social and Economic History of the Southwest II

History (HIEU) 124/ VIS 122E. The City in Italy

History (HILA) 115. The Latin American City, a History

History (HILA) 121. History of Brazil

History (HISC) 105. History of Environmentalism

History (HITO) 121. Geographic Information Systems for Historians and Social Scientists

History (HIUS) 114. California History

History (HIUS) 117. History of Los Angeles

History (HIUS) 137. The Built Environment in the Twentieth Century

History (HIUS) 140/Economics158A. Economic History

History (HIUS) 141/Economics 158B.Economic History of the United States II

History (HIUS) 154. Western Environmental History

History (HIUS) 184. Special Topics in American Urban History

The Minor Program

The urban studies and planning minor consists of seven courses in urban studies and planning, selected with the prior approval of the USP student affairs adviser. Students who wish to minor in urban studies may do so by taking any two courses from among the lower-division sequence and the upper-division foundation courses, and five upper-division courses from among those that serve the USP major. All courses must be taken for a letter grade and students must earn at least C– in each course used for the minor.

Education Abroad Program

Students are encouraged to participate in the UC Education Abroad Program (EAP) or Opportunities Abroad Program (OAP) while still making progress towards completing their USP major. For more information on EAP, see the section of this catalog on the Education Abroad Program or visit http://www.ucsd.edu/icenter/pao. Students considering this option are advised to discuss their plans with the USP student affairs adviser before going abroad.

COURSES

LOWER-DIVISION

1. History of US Urban Communities (4)
This course charts the development of urban communities across the United States both temporally and geographically. It examines the patterns of cleavage, conflict, convergence of interest, and consensus that have structured urban life. Social, cultural, and economic forces will be analyzed for the roles they have played in shaping the diverse communities of America's cities.

2. Urban World System (4)
Examines cities and the environment in a global context. Emphasizes how the world's economy and the earth's ecology are increasingly interdependent. Focuses on biophysical and ethicosocial concerns rooted in the contemporary division of labor among cities, Third World industrialization, and the post-industrial transformation of U.S. cities.

3. The City and Social Theory (4)
An introduction to the sociological study of cities, focusing on urban society in the United States. Students in the course will examine theoretical approaches to the study of urban life; social stratification in the city; urban social and cultural systems–ethnic communities, suburbia, family life in the city, religion, art, and leisure.

UPPER-DIVISION

101. Introduction to Policy Analysis (4)
(Same as Political Science 160AA.) This course will explore the process by which the preferences of individuals are converted into public policy. Also included will be an examination of the complexity of policy problems, methods for designing better policies, and a review of tools used by analysts and policy makers. *Prerequisite: upper-division standing or consent of instructor.*

102. Urban Economics (4)
(Same as Economics 135.) Economic analysis of why and where cities develop, problems they cause, and public policies to deal with these problems. Determination of urban land rent/use, reasons for suburbanization. Transportation and congestion in cities, zoning, poverty and housing, urban local government. *Prerequisites: Economics 1A-B.*

103. American Cities in the Twentieth Century (4)
(Same as HIUS 148.)This course surveys changes in U.S. cities since about 1900. Case studies of individual cities illustrate the social, political, and environmental consequences of rapid urban expansion, as well as the ways in which "urban problems" have been understood historically. *Prerequisite: upper-division standing or consent of instructor.*

104. Ethnic Diversity and the City (4)
(Same as Ethnic Studies 105.) This course will examine the city as a crucible of ethnic identity exploring both the racial and ethnic dimensions of urban life in the U.S. from the Civil War to the present. *Prerequisite: upper-division standing.*

105. Urban Sociology (4)
(Same as Sociology C/153.) Introduces students to the major approaches in the sociological study of cities and to what a sociological analysis can add to our understanding of urban processes. *Prerequisite: upper-division standing or consent of instructor.*

107. Urban Politics (4)
(Same as Political Science 102E.) This survey course focuses upon the following six topics: the evolution of urban politics since the mid-nineteenth century; the urban fiscal crisis; federal/urban relationships; the "new" politics; urban power structure and leadership; and selected contemporary policy issues such as downtown redevelopment, poverty, and race.

109. California Government and Politics (4)
(Same as Political Science 103A.) This survey course explores six topics: 1) the state's political history; 2) campaigning, the mass media, and elections; 3) actors and institutions in the making of state policy; 4) local government; 5) contemporary policy issues; e.g., Proposition 13, school desegration, crime, housing and land use, transportation, water; 6) California's role in national politics. *Prerequisite: upper division standing*

110. Advanced Topics in Urban Politics (4)
(Same as Political Science 102J.) Building upon the introductory urban politics course, the advanced topics course explores issues such as community power, minority empowerment, and the politics of growth. A research paper is required. Students wishing to fulfill the paper requirement with field research should enroll in the subsequent Political Science 102JJ course offered Summer Session II. *Prerequisites: upper division standing, consent of instructor.*

111. Field Research in Urban Politics (4)
(Same as Political Science 102JJ.) To be taken with the approval of the Political Science 102J instructor, this course allows students to do original field research on topics in urban politics. This course is offered in Summer Session II subsequent to a spring 102J course. May not be used to fulfill any major or minor requirements in politics science or urban studies and planning. *Prerequisites: USP 110/Political Science 102J and consent of instructor.*

112. The Amereican Welfare State (4)
(Same as Political Science 166F.) This course examines the transformation of the American welfare state in the twentieth century. Topics include Progressivism, the New Deal and Great Society; Reagan-era retrenchment; race, gender and social policy, and policy devolution to state and local governments. *Prerequisite: upper-division standing.*

113. Politics and Policymaking in Los Angeles (4)
(Same as Political Science 103B.) This course examines politics and policymaking in the five-county Los Angeles region. It explores the historical development of the city, suburbs, and region; politics, power, and governance; and major policy challenges facing the

city and metropolitan area. *Prerequisite: upper-division standing.*

115. Politics and Policymaking in San Diego (4)
(Same as Political Science 103C.) This course examines how major policy decisions are made in San Diego. In analyses the region's power structure (including the roles of non-governmental organizations and the media), governance systems and reform efforts, and the politics of major infrastructure projects. *Prerequisite: upper-division standing or consent of instructor.*

124. Land Use Planning (4)
Introduction to land use planning in the United States: zoning and subdivision, regulation, growth management, farmland preservation, environmental protection, and comprehensive planning. *Prerequisite: upper-division standing or consent of instructor.*

129. Research Methods: Studying Racial and Ethnic Communities (4)
(Same as ETHN 190.) The course offers students the basic research methods with which to study ethnic and racial communities. The various topics to be explored include human and physical geography, transportation, employment, economic structure, cultural values, housing, health, education, and intergroup relations. *Prerequisite: upper-division standing or consent of instructor.*

130. Field Work in Racial and Ethnic Communities (4)
(Same as ETHN 107.) This is a research course examining social, economic, and political issues in ethnic and racial communities through field work. Topics are examined through a variety of research methods which may include interviews and archival, library, and historical research. *Prerequisite: upper-division standing.*

132. African Americans, Religion, and the City (4)
(Same as Ethnic Studies 188.) This course details the history of African-American migration to urban areas after World War I and World War II and explore the role of religion in their lives as well as the impact that their religious experiences had upon the cities in which they lived. *Prerequisite: upper-division standing.*

133. Social Inequality and Public Policy (4)
(Same as SOC C/152.) Primary focus on understanding and analyzing poverty and public policy. Analysis of how current debates and public policy initiatives mesh with alternative social scientific explanations of poverty. *Prerequisite: upper-division standing.*

135. Asian and Latina Immigrant Workers in the Global Economy (4)
(Same as ETHN 129.) This course will explore the social, political, and economic implications of global economic restructuring, immigration policies, and welfare reform on Asian and Latina immigrant women in the United States. We will critically examine these larger social forces from the perspectives of Latina and Asian immigrant women workers, incorporating theories of race, class, and gender to provide a careful reading of the experiences of immigrant women on the global assembly line. *Prerequisite: upper-division standing.*

137. Housing and Community Development Policy and Practice (4)
This course considers the history, theory, and practice of U.S. housing and community development. It examines how the public, private, and nonprofit sectors shape and implement planning and policy decisions at the federal, state, local and neighborhood levels. *Prerequisite: upper-division standing.*

139. Race, Gender, and Urban Planning (4)
This course explores the nexus between race, gender, and urban planning. Lectures address how women and people of color shape the city through design, policy, and advocacy. The course also considers the impact of traditional planning on these two groups. *Prerequisite: upper-division standing.*

143. The U.S. Health Care System (4)
This course will provide an overview of the organization of health care within the context of the community with emphasis on the political, social, and cultural influences. It is concerned with the structure, objectives, and trends of major health and health-related programs in the United States to include sponsorship, financing, training and utilization of health personnel. *Prerequisite: upper-division standing or consent of instructor.* (Offered winter quarter.)

144. Environmental and Preventive Health Issues (4)
This course will analyze needs of populations, highlighting current major public health problems such as chronic and communicable diseases, environmental hazards of diseases, psychiatric problems and additional diseases, new social mores affecting health maintenance, consumer health awareness and health practices, special needs of economically and socially disadvantaged populations. The focus is on selected areas of public and environmental health, namely: epidemiology, preventive services in family health, communicable and chronic disease control, and occupational health. *Prerequisite: upper-division standing or consent of instructor.* (Offered fall quarter.)

145. Aging–Social and Health Policy Issues (4)
This course will provide a brief introduction to the nature and problems of aging, with emphasis on socioeconomic and health status; determinants of priorities of social and health policies will be examined through analysis of the structure and organization of selected programs for the elderly. Field visits will constitute part of the course. *Prerequisite: upper-division standing.* (S)

147. Case Studies in Health Care Programs/Poor and Underserved Population (4)
The purpose of this course is to identify the special health needs of low income and underserved populations and to review their status of care, factors influencing the incidence of disease and health problems, and political and legislative measures related to access and the provision of care. Selected current programs and policies that address the health care needs of selected underserved populations such as working poor, inner city populations, recent immigrants, and persons with severe disabling mental illnesses will be studied. Offered in alternate years. *Prerequisite: upper-division standing or consent of instructor.* (Not offered 2003–2004.)

165. History of the American Suburb (4)
(Same as HIUS 147.) This seminar explores the development of suburbs in America, from the early nineteenth-century to the contemporary era. Topics include suburban formation, class, ethnic and racial dimensions, government influences, social life, and cultural responses to suburbia. The class will explore influences, social life, and cultural responses to suburbia. The class will explore competing theories of suburbanization as it surveys the major literature. *Prerequisite: upper-division standing.*

166. History of San Diego (4)
A lecture-discussion course that surveys the social, political, economic, cultural and environmental history of the San Diego region from pre-colonial times to the present, with emphasis on the urban development that has occurred since 1900. *Prerequisite: upper-division standing.*

171. Sustainable Development (4)
Sustainable development is a concept invoked by an increasingly wide range of scholars, activists, and organizations dedicated to promoting environmentally sound approaches to economic development. This course critically examines the diverse, often contradictory, interests in sustainability. It provides a transdisciplinary overview of emergent theories and practices. *Prerequisite: upper-division standing.*

172. Planning/Policy-making: U.S.-Mexican Border Region (4)
Course examines globalization and key regional/urban policy issues facing U.S.-Mexico border zone, including industrialization, urban sprawl, environmental management, trade and infrastructure planning, social policy, transportation; focus on problems in the San Diego-Baja California region. *Prerequisite: upper-division standing.*

173. History of Urban Planning and Design (4)
The analysis of the evolution of city designs over time; study of the forces that influence the form and content of a city: why cities change; comparison of urban planning and architecture in Europe and the United States. *Prerequisite: upper-division standing.*

174. Regional Governance and Planning Reconsidered (4)
Regional planning and local governance in California, focusing upon San Diego. Current system, the state/local relationship, and the incentives and disincentives for restructuring regional and local governance and planning. *Prerequisite: upper-division standing.*

179. Urban Design, Theory, and Practice (4)
Roles of the urban designer, preparing schematic proposals and performance statements, identifying opportunities for and constraints on designers. Each student will prepare a practical exercise in urban design using various urban design methods. *Prerequisite: upper-division standing.*

180. Transportation Planning (4)
Introduction to the history and current state of urban transportation planning, including the relationship between transportation and urban form; role of automotive, mass transit, and alternative modes; methods for transportation systems analysis; decision-making, regulatory, and financing mechanisms; and public attitudes. *Prerequisite: upper-division standing.*

186. Urban Field Work Seminar (6)
Introduces students to the theory and practice of social research. Introduces techniques for logging data, including field notes and filing systems. During the second half of USP 186, students must complete five weeks (50 hours) of the ten week (100 hour) internship requirement of the senior sequence. *Prerequisites: USP major and senior status.*

187. Urban Studies Internships (6)
An intensive research and internship experience that culminates in an original senior thesis. Students learn about the theoretical and technical challenges of

scholarly research and publication. *Prerequisites: USP 186 and USP major.*

190. Senior Honors Seminar (4)
Each student enrolled will be required to write an honors essay, a substantial research paper on a current urban policy issue, under the supervision of a member of the faculty. Most often the essay will be based on their previous fieldwork courses and internship. This essay and other written exercises, as well as class participation, will be the basis of the final grade for the course. The seminar will rotate from year to year among the faculty in urban studies and planning. *Prerequisites: USP 186, USP 187, major GPA 3.5, and permission of instructor.*

192. GIS for Urban and Community Planning (4)
Introduction to Geographic Information Systems and using GIS to make decisions: acquiring data and organizing data in useful formats; demographic mapping; geocoding. Selected exercises examine crime data, political campaigns, banking and environmental planning, patterns of bank lending and finance. *Prerequisite: upper-division standing.*

193. San Diego Community Research (6)
Using the San Diego region as a case study, students will be introduced to the process of collecting, evaluating, and presenting urban and regional data using a variety of methods including aggregate data analysis, historical research, ethnography, and GIS mapping. *Prerequisite: consent of instructor.*

194. Research Seminar in Washington, D.C. (4)
(Same as Cognitive Science 194, Communication 194, Earth Science 194, History 193, Political Science 194, Sociology E/194.) Course attached to six-unit internship taken by students participating in the UCDC program. Involves weekly seminar meetings with faculty and teaching assistant and a substantial research paper. *Prerequisite: department approval. Participating in UCDC program.*

195. Teaching Apprentice–Undergraduate (2-4)
Introduction to teaching activities associated with course. Responsibilities include preparing reading materials assigned by the instructor, attending course lectures, meeting at least one hour per week with the instructor, assisting instructor in grading, and preparing a summary report to the instructor. *Prerequisites: consent of instructor and an A in the course in which the student plans to assist.*

198. Directed Group Study (2-4)
Directed group study on a topic or in a field not included in the regular departmental curriculum by special arrangement with a faculty member. *Prerequisites: upper-division standing and consent of instructor.*

199. Independent Study (2-4)
Reading and research programs and field-study projects to be arranged between student and instructor, depending on the student's needs and the instructor's advice in terms of these needs. *Prerequisites: upper-division standing and consent of instructor.*

Visual Arts

OFFICE: 216 Mandeville Center for the Arts
http://visarts.ucsd.edu

Professors

David Antin, M.A., *Emeritus*
Eleanor Antin, B.A., *Emeritus*
Sheldon G. Brown, M.F.A.
Norman Bryson, Ph.D.
Harold Cohen, *Diploma of Fine Arts, Emeritus*
Steve Fagin, M.A., *Chair*
Manny Farber, *Emeritus*
Jean-Pierre Gorin, *Licence de Philosophie*
Helen Mayer Harrison, M.A., *Emeritus*
Newton A. Harrison, M.F.A., *Emeritus*
Louis J. Hock, M.F.A.
Madlyn M. Kahr, Ph.D., *Emeritus*
Allan Kaprow, M.A., *Emeritus*
Barbara Kruger
Fred S. Lonidier, M.F.A.
Kim R. MacConnel, M.F.A.
Babette M. Mangolte
Sheldon A. Nodelman, Ph.D.
Patricia A. Patterson, *Emeritus*
Faith Ringgold, M.A., *Emeritus*
Jerome Rothenberg, M.A., *Emeritus*
Ernest R. Silva, M.F.A.
Haim Steinbach, M.F.A.
Lesley F. Stern, Ph.D.
John C. Welchman, Ph.D.

Associate Professors

Jack M. Greenstein, Ph.D.
Adriene Jenik, M.F.A.
Grant Kester, Ph.D.
Sandra Kogut
Standish D. Lawder, Ph.D., *Emeritus*
Lev Manovich, Ph.D.
Elizabeth Newsome, Ph.D.
Rubén Ortiz-Torres, M.F.A.
Jennifer Pastor, M.F.A.
Susan L. Smith, Ph.D.
Phel Steinmetz, *Academic Senate Distinguished Teaching Award*
Mary Vidal, Ph.D.

Assistant Professors

Amy J. Alexander, M.F.A.
Jordan Crandall
Natalie Jeremijenko, B.F.A.
Roberto Tejada, Ph.D.

Lecturer with Security of Employment

Claudio Fenner-Lopez, M.A., *Emeritus*

Lecturer with Potential for Security of Employment

Brett Stalbaum

The Department of Visual Arts offers courses in painting, drawing, sculpture, performance, computing for the arts, film, video, photography, and art history/criticism (including that of film and video). A bachelor's degree from this department provides students with a solid liberal arts background and is preparatory training for careers as artists, art historians, filmmakers, video artists, photographers, digital media artists, and art critics. It also provides students the initial skills required for teaching and work in museums, television, and the commercial film, photography, and internet industries.

By its composition, the Department of Visual Arts is biased in the direction of actively producing artists and critics whose presence at the center of the contemporary art world necessitates reconsideration and reevaluation of artistic productions, their information structure, and significance. Consequently, a flexible introductory program of historically based courses has been devised mainly to provide the student an opportunity to concentrate on areas involving significantly different aesthetic and communication structures. A series of studio courses, in which painting and sculpture are included, is presented to bring the student into direct contact with the real contingencies compelling redistribution of aesthetic attitudes and reinterpretation of genres. Because of the exploratory nature of our program, the department is prepared to emphasize new media that would traditionally be considered to have scant relation to the visual arts. Thus, courses in theatrical events, linguistic structures, etc., are provided. In this context, theoretical courses with a media orientation, as in film, video, photography, or computing, are also offered.

The Department of Visual Arts is located in the Mandeville Center for the Arts. In addition, faculty and graduate students have offices/studios/research spaces in the Visual Arts Facility located in Sixth College. Facilities and equipment are

available to undergraduates in both the Mandeville Center and at the campus-wide Media Center, providing the opportunity to study painting, drawing, photography, computing in the arts, 16mm film, performance, sculpture, and video. Facilities at the Media Center include portable video recording equipment, video and audio editing suites, non-linear editing, and production studios. Additional film equipment available includes an animation stand, optical printer, two sound-mixing studios, and numerous film editing suites. Courses in computing in the arts take place in the Silicon Graphics/Mac/NT lab located at the Visual Arts Facility, the INTEL-shared lab in the Applied Physics and Mathematics building, and a dedicated ICAM lab in building 201 University Center.

The University Art Gallery displays a continually changing series of exhibitions, and the Mandeville Annex Gallery, located on the lower level, is directed by visual arts undergraduate students. A gallery and performance space, located in the Visual Arts Facility, are directed by graduate students.

The Undergraduate Program

College Requirements

The Department of Visual Arts teaches courses applicable toward the Muir, Sixth, and Warren general-education requirements, the Marshall humanities requirement, the Eleanor Roosevelt and Revelle fine arts requirements. Optional minors may be taken within any college.

Minor in Visual Arts

The Department of Visual Arts offers minors in seven areas of study: studio painting/drawing/sculpture, photography, computing, art history, media history/criticism, film/video, and ICAM. A minor consists of six specific courses of which at least three must be upper-division. Effective January 1, 1998, a minor will consist of seven specific courses, of which at least five must be upper-division. Because the requirements differ for each minor, prospective visual arts minors should consult with the departmental adviser for a complete list of appropriate classes acceptable for the minor.

Students are advised to begin their program in the second year; otherwise, they cannot be guaranteed enough time to complete the classes required for a minor.

Education Abroad Program

Students are often able to participate in the UC Education Abroad Program (EAP) and UCSD's Opportunities Abroad Program (OAP) while still making progress toward completing their major. Financial aid is applicable to study abroad and special study abroad scholarships are readily available. Students considering this option should discuss their plans with the director of Undergraduate Studies before going abroad, and courses taken abroad must be approved by the department. More information on EAP/OAP is detailed in the Education Abroad Program of the *UCSD General Catalog* or on their Web site http://ucsd.edu/icenter/pao. Interested students should contact the Programs Abroad Office in the International Center.

Residency Requirements

A minimum of two-thirds of the course work completed for the major must be taken at UCSD. Students who transfer to UCSD in their second or third year may petition to substitute courses taken at other colleges and universities for major requirements.

Visual Arts 111, Structure of Art, must be taken at UCSD by all students, including transfer students, in the art history, media, and studio majors.

Note: Rarely are community college transfer credits accepted toward fulfilling upper-division requirements in any of the four majors, but courses of comparable content will be considered by petition.

Honors Programs

The department offers honors programs in art history, in media, and in studio for outstanding students.

The **art history** honors program will provide outstanding students with pre-professional experience. It consists of an issue-oriented seminar followed by a directed group study and will result in an exhibition with catalogue, a scholarly conference with a mock publication and/or series of research papers. Students who meet the criteria may, with permission of the art history faculty adviser or the art history honors seminar instructor, enroll in the art history honors program during the last quarter of their junior year or as a senior. This program is open to juniors and seniors who meet eligibility requirements: minimum GPA of 3.5 (3.3 overall), completion of all lower-division art history requirements, completion of all upper-division art history distribution requirements, and completion of Art Historical Methods (VIS 112) and at least one additional art history seminar. The level of distinction will be determined by the faculty committee on the basis of work in the honors seminar and on the research project.

The **media** honors program will help students develop high quality professional portfolios. The honors thesis project sequence of individual studies runs the length of an academic year to provide sufficient time for ideas to develop and critically aware work to be produced. Students may arrange to work with different faculty advisers each term or may engage a single adviser for the year. To be eligible for the honors thesis sequence, students must have at least a 3.5 GPA in the major and have approval of all the advisers with whom they will work. Qualified students may begin their sequence the last quarter of their junior year or during their senior year. At the end of the third quarter, all involved media faculty will meet to critique the overall quality of the final thesis work to determine level of distinction.

Through exhibition, verbal and written presentations and course work, the **studio** honors program is intended to give the student as strong a technical, critical, and theoretical base as possible. The program is open to juniors and seniors with a minimum 3.5 GPA in the major (3.0 overall), who have completed all lower-division studio requirements and all upper-division groups I, II, III, and IV (subgroup A) requirements.

Students interested in participating in an honors programs should consult with the departmental adviser.

Double Major within the Department

There are three double majors within the Visual Arts department: Art History/Theory/Criticism paired with either studio, media, or ICAM. Students interested in a double major within the department must have at least ten upper-division courses that are unique to each departmental major and the remaining courses may overlap with other major requirements. Students should consult with the departmental adviser for additional information.

Major Requirements

Twenty courses are required in studio, media, and ICAM and eighteen courses in art history for the attainment of the bachelor of arts degree. A minimum of twelve of these courses must be upper-division, however, some majors may require more upper-division courses.

All courses taken to satisfy major requirements must be taken for a letter grade, and only grades of C– or better will be accepted in the visual arts major.

Studio Major

The studio major is aimed at producing a theoretically based, highly productive group of artists. Lower-division courses are structured to expose students to a variety of ideas in and about the visual arts. Introductory skills are taught, but their development will occur at the upper-division level in conjunction with the student's increasing awareness of the range of theoretical possibilities in the field. The curriculum includes courses in drawing, painting, sculpture, performance, photography, video, 16mm film, many offerings in art history/criticism, as well as new courses in digital imaging and electronics.

GROUP I: LOWER-DIVISION

Foundation Level

Five courses required

1	Introduction to Art Making: Two-Dimensional Practices
2	Introduction to Art Making: Motion and Time Based Art
3	Introduction to Art Making: Three-Dimensional Practices
22	Formations of Modern Art

Choose one from:

20	Introduction to Art History
21	Introduction to Non-Western Art
84	History of Film

GROUP II: UPPER-DIVISION

Entry Level

Five courses required

111	Structure of Art

Note: Required for Visual Arts studio, media, and art history majors. VIS 111 can be taken at the same time as any "A" series classes or VIS 40, 60 or 70N. VIS 40, 60, or 70N can be taken to fulfill Group II entry level studio requirements, but will not count toward the fifteen upper-division courses needed to fulfill the major requirements.

Choose four from:

40/ICAM 40	Introduction to Computing in the Arts
60	Introduction to Photography
70N	Introduction to Media
104A	Performing the Self
105A	Drawing: Representing the Subject
106A	Painting: Image Making
107A	Sculpture: Making the Object

GROUP III: UPPER-DIVISION

Intermediate Level

Two courses required

104BN	Verbal Performance
105B	Drawing: Practices and Genre
105D	The Aesthetics of Chinese Calligraphy
106B	Painting: Practices and Genre
107B	Sculpture: Practices and Genre
140/ICAM 101	Digital Imaging: Image and Interactivity
147A	Electronic Technologies for Art I

Group IV: UPPER-DIVISION

Advanced Level

Five courses required

GROUP A:

Choose two from:

104CN	Personal Narrative
105C	Drawing: Portfolio Projects
105E	Chinese Calligraphy as Installation
106C	Painting: Portfolio Projects
107CN	Sculpture: Portfolio Projects
147B	Electronic Technologies for the Art II

GROUP B:

Group A must be completed before Group B can be taken.

Choose three from:

108	Advanced Projects in Art
110A	Contemporary Issues and Practices
110B	New Genres/New and Old Technologies
110C	Proposals, Plans, Presentations
110D	Visual Narrative/Tableau
110E	Art in Public Places/Site Specific Art
110F	Installation: Cross-Disciplinary Projects
110G	The Natural and Altered Environment
110H	Image and Text Art
110I	Performing for the Camera
110J	Ritual Performance
110K	Installation Performance
130	Special Projects in Visual Arts
132	Installation Production and Studio

GROUP V: UPPER-DIVISION

Non-Studio

Three courses required

Upper-division art history, film history, and theory/criticism courses such as:

113CN*	History of Criticism III: Contemporary (1950–present)
117B*	Theories of Representation
117D*	Portraiture
124CN	Nineteenth Century Art
125A	Twentieth Century Art
125BN	Contemporary Art
125CN	Histories and Contexts of Conceptual Art
125E*	History of Performance
126F*	Western and Non-Western Rituals and Ceremonies
152	Film in Social Context
154	Hard Look at the Movies
157	Video History and Criticism
158	Histories of Photography
159/ICAM 150	History of Art and Technology
194	Fantasy in Film

*seminar

HONORS PROGRAM IN STUDIO

110M	Studio Honors I
110N	Studio Honors II

The Studio Honors I and the attached Studio Honors II count as one course towards the fulfillment of a Group IV requirement.

Art History/Theory/Criticism Major

The major in art history, theory, and criticism is designed both for students who desire a broadly based education in the humanities and for those who plan to pursue a career in an art-related profession. In both cases, the foundation for study is proficiency in the languages of artistic expression. Through the study of art history, students learn to treat works of art as manifesta-

tions of human belief, thought, and experience in Western and non-Western societies from prehistory to the present day. Courses in criticism review the theoretical approaches which are used to understand artistic achievement. By combining art historical and critical study, the program promotes in the student an awareness of the cultural traditions which have shaped his or her intellectual outlook and provides a framework for informed judgment on the crucial issues of meaning and expression in contemporary society.

Majors are encouraged to take relevant courses in allied disciplines such as history, communication, anthropology, and literature, and in such area programs as classics and Italian studies. In addition, students who plan to apply to graduate schools are strongly advised to develop proficiency in one or more foreign languages, as is dictated by their area of specialization.

FOUNDATION LEVEL—LOWER-DIVISION

Five courses required

20	Introduction to Art History
21	Introduction to Non-Western Art
22	Formations of Modern Art
23	Information Technologies in Art History

Choose one from:

1, 2, 3	Introduction to Art-Making
60	Introduction to Photography
70N	Introduction to Media

Note: VIS 23 must be completed by the end of the sophomore year or taken the first time it is offered after a junior declares an art history major or transfers into the program.

ADVANCED LEVEL—UPPER-DIVISION

Thirteen courses required

GROUP I—Required Courses

Two courses

These two courses are required for all art history and criticism majors:

111	Structure of Art*
112	Art Historical Methods

Note: Majors must complete VIS 112 by the end of their junior year and are strongly advised to do so earlier.

* Required of Visual Arts art history, media, and studio majors.

GROUP II—DISTRIBUTIONAL REQUIREMENT

Five courses

Choose one course from each of the following areas:

A. **Pre-Modern: Ancient and Medieval**

120A	Greek Art
120B	Roman Art
120C	Late Antique Art
120D	Prehistoric Art
121AN	The Idea of Medieval Art
121B	Castles, Cathedrals, and Cities
121C*	Art and Gender in the Middle Ages and Renaissance
121D*	The Illuminated Manuscript in the Middle Ages
121E	The Pursuit of the Millennium
128AN	Topics in Pre-Modern Art History
129AN*	Special Problems in Pre-Modern Art History

B. **Early Modern: Renaissance and Baroque**

122AN	Renaissance Art
122CN	Defining High Renaissance Art
122D	Michelangelo
122E*	The City in Italy
123AN	Between Spirit and Flesh: Northern Art of the Early Renaissance
123BN*	Jan van Eyck
123CN*	Early Print Culture: The First Media Revolution
124AN	Baroque Art
128BN	Topics in Early Modern Art History
129BN*	Special Problems in Early Modern Art History

C. **Modern**

124BN	Art and the Enlightenment
124CN	Nineteenth Century Art
125A	Twentieth Century Art
125BN	Contemporary Art
125CN	Histories and Contexts of Conceptual Art
125DN*	Marcel Duchamp
125E*	History of Performance
128CN	Topics in Modern Art History
129CN*	Special Problems in Modern Art History
158	Histories of Photography
159/ICAM 150	History of Art and Technology

D. **Non-Western**

126AN	Pre-Columbian Art of Ancient Mexico and Central America
126BN	The Art and Civilization of the Ancient Maya
126CN	Art of the North American Indians
126DN	African and Afro-American Art
126E	Oceanic Art
126F*	Western and Non-Western Rituals and Ceremonies
126G*	Problems in Mesoamerican Art History
126H*	Problems in Ancient Mayan Iconography and Inscriptions
128DN	Topics in Non-Western Art History
129DN*	Special Problems in Non-Western Art History

E. **Theory**

113AN*	History of Criticism I: Early Modern
113BN*	History of Criticism II: Early Twentieth Century (1900–1950)
113CN*	History of Criticism III:Contemporary (1950–Present)
117A*	Narrative Structures
117B*	Theories of Representation
117C*	Art in Time: The Historical Dimension
117D*	Portraiture
117E*	Problems in Ethnoaesthetics
128EN	Topics in Art Theory and Criticism
129EN*	Special Problems in Art Theory and Criticism

*seminar

Students must take at least two upper-division seminars in addition to VIS 112 and to the course taken in fulfillment of the distribution requirement for Theory. These two additional seminars may be taken in fulfillment of Pre-Modern, Early Modern, Modern and Non-Western or as open electives.

Art history majors cannot enroll in more than one upper-division seminar without having completed Information Technologies in Art History (VIS 23) and Art Historical Methods (VIS 112).

GROUP III—ELECTIVES

Six courses

Students are required to take six upper-division courses in addition to VIS 111, VIS 112 and those used to fulfill the distribution requirements. At least three of these must be courses

in art history or theory. For the remaining three, choose from the following:

- Any upper-division art history course (s) in history or theory
- any upper-division course(s) in media history and criticism (e.g., VIS 150, 151, 152, 153, 154, 155, 156N, 157);
- up to two upper-division courses in studio or media production; or
- with permission of art history faculty adviser, one upper-division course in a related department or program such as anthropology, history, literature, or critical gender studies.
- Two two-unit curatorial practices workshop courses (VIS 127A) count as one course towards the fulfillment of an elective.

Media Major

With a visual arts foundation, the program is designed for students who want to become creative videomakers, filmmakers, photographers, and computer artists, encouraging the hybridity of media. The curriculum combines hands-on experience of making with practical and theoretical criticism, provides historical, social, and aesthetic backgrounds for the understanding of modern media, and emphasizes creativity, versatility, and intelligence over technical specializations. It should allow students to go on to more specialized graduate programs in the media arts, to seek careers in film, television, computing, or photography, or to develop as independent artists. All media majors should see the Visual Arts Undergraduate Adviser upon entrance into UCSD.

FOUNDATION LEVEL—LOWER-DIVISION

Six courses required

GROUP A

1 or 2 or 3	Introduction to Art Making
22	Formations of Modern Art
84	History of Film

GROUP B

40/ICAM 40	Introduction to Computing in the Arts
60	Introduction to Photography
70N	Introduction to Media

All six courses listed under Groups A and B above are required. VIS 70N is prerequisite for use of the Media Center facilities; no further production courses may be taken until VIS 70N is completed.

INTERMEDIATE LEVEL—UPPER-DIVISION

Nine courses required

GROUP A

Six courses required

111	Structure of Art
174	Media Sketchbook

Both VIS 111 and VIS 174 are required and prerequisite to further study. Additionally, all courses from one of the following emphases are required.

Computing Emphasis

Three courses plus one from photography or film/video

140/ICAM 101	Digital Imaging: Image and Interactivity
145A/ ICAM 102	Digital Media I: Time, Movement, Sound
145B	Digital Media II

Photography Emphasis

Two courses plus two from computing or film/video

164	Photographic Strategies
165	Camera Techniques

Film and Video Emphasis

Three courses plus one from computing or photography

172	Studio Video
176	Introduction to Filmmaking
177	Scripting and Editing Strategies

GROUP B–History, Criticism, and Theory

Three courses required

113BN	History of Criticism II: Early Twentieth Century (1900–1950)
113CN	History of Criticism III: Contemporary (1950–Present)
117B	Theories of Representation
150	History and Art of the Silent Cinema
151	History of Experimental Film
152	Film in Social Context
153	The Genre Series
154	Hard Look at the Movies
155	The Director Series
156N	Special Problems in Film History and Theory
157	Video History and Criticism
158	Histories of Photography
159/ICAM 150	History of Art and Technology

Note: Any art history courses in Pre-Modern, Early Modern, Modern, and Theory may be taken to fulfill the Group B requirement.

VIS 158 is required for all students with a photography emphasis.

VIS 159/ICAM 150 is required for all students with a computing emphasis.

ADVANCED LEVEL—UPPER DIVISION

Five courses required

180A	Documentary Evidence and the Construction of Authenticity in Current Media Practices
180B	Fiction and Allegory in Current Media Practices

Both of the above are required. Additionally, three electives must be taken. VIS 180A and 180B cannot be taken concurrently.

Electives

Three courses required

Computing Emphasis

147A/B	Electronic Technologies for Art I and II
149/ICAM 130	Seminar in Contemporary Computer Topics

Photography Electives

166	Advanced Camera Techniques

Film and Video Electives

181	Sound and Lighting
182	Advanced Editing
186	Advanced Filmmaking Strategies

VIS180A/B must be completed before any of the following four courses may be taken; instructor approval is required to enroll:

109	Advanced Projects in Media
131	Special Projects in Media
132	Installation Production and Studio
197	Media Honors Thesis

Note: Enrollment in production courses is limited to two per quarter. Production courses are numbered VIS 109, 131, 132, 140/ICAM 101, 141A-B, 145A/ICAM 102, 145B, 147A-B, 164-166, 172-177, and 180A-186.

Interdisciplinary Computing and the Arts (ICAM)

The Interdisciplinary Computing and the Arts major in the Music and Visual Arts departments draws upon, and aims to bring together, ideas and paradigms from computer science, art, and cultural theory. It takes for granted that the computer has become a metamedium and that artists working with computers are expected to combine different media forms in their works. All of this makes the program unique among currently existing computer art or design programs which, on the one hand, usually focus on the use of computers for a particular media (for instance, specializing in computer animation, or computer music, or computer design for print) and, on the other hand, do not enter into a serious dialogue with current research in computer science, only teaching the students "off-the-shelf" software.

The program also recognizes that creating sophisticated artistic works with computers requires a new model of the creative process, one which combines traditional artistic procedures with the experimental research characteristic of the sciences. All in all, it aims to train a new type of cultural producer, who is familiar with art and media history, who is equally proficient with computer programming and artistic skills, who is always ready to learn new technologies, and who is comfortable interacting with scientists and computer industry resources.

The goals of the program are:

- to prepare the next generation of artists who will be functioning in a computer-mediated culture
- to give students necessary technical, theoretical, and historical backgrounds so they can contribute to the development of new aesthetics for computer media
- to prepare students to mediate between the worlds of computer science and technology, the arts, and the culture at large by being equally proficient with computing and cultural concepts
- to give students sufficient understanding of the trajectories of development in computing so they can anticipate and work with the emerging trends, rather than being locked in particular software currently available on the market

LOWER-DIVISION

Eight courses required

Arts

Four courses required

MUS 4	Introduction to Western Music
VIS 1	Introduction to Art-Making: Two-Dimensional Practices
VIS 22	Formations of Modern Art
VIS 70N	Introduction to Media

Computer Science

One course required

CSE 11	Introduction to Computer Science: JAVA

NOTE: CSE 11 is an accelerated course in the JAVA programming language. CSE 8A and 8B, which cover the same material in a non-accelerated format, may be substituted.

Mathematics

Two courses required

MATH 20A	Calculus for Science and Engineering
MATH 20B	Calculus for Science and Engineering

NOTE: MATH 20A and 20B are accelerated calculus courses for Science and Engineering. MATH 10A, 10B, and 10C, which cover similar material in a non-accelerated format, may be substituted.

Computing and the Arts

One course required

ICAM 40/ VIS 40	Introduction to Computing in the Arts

UPPER-DIVISION

Twelve courses required

Survey

One course required

ICAM 110	Computing in the Arts: Current Practice

Foundation

Three courses required

ICAM 101/ VIS 140	Digital Imaging: Image and Interactivity
ICAM 102/ VIS 145A	Digital Media I: Time, Movement, Sound
ICAM 103/ MUS 170	Musical Acoustics

Advanced

Four courses required

Choose one from:

VIS 141B	Computer Programming for the Arts II
VIS 145B	Digital Media II
VIS 147B	Electronic Technologies for Art II
MUS 172	Computer Music II

Choose three from:

ICAM 120	Virtual Environments
ICAM 130/ VIS 149	Seminar in Contemporary Computer Topics
VIS 109	Advanced Projects in Media
VIS 131	Special Projects in Media
VIS 132	Installation Production and Studio
VIS 141A	Computer Programming for the Arts I
VIS 147A	Electronic Technologies for Art I
VIS 174	Media Sketchbook
MUS 171	Computer Music I
MUS 173	Audio Production: Mixing and Editing
MUS 174A-B	Audio and MIDI Studio Techniques
MUS 175	Musical Psychoacoustics
MUS 176	Music Technology Seminar

Theory and History

Two courses required

ICAM 150/ VIS 159	History of Art and Technology

and one of:

VIS 123CN	Early Print Culture: The First Media Revolution
VIS 125E	History of Performance
VIS 150	History and Art of the Silent Cinema
VIS 151	History of the Experimental Film
VIS 152	Film in Social Context
VIS 153	The Genre Series
VIS 154	Hard Look at the Movies
VIS 155	The Director Series
VIS 156N	Special Problems in Film History and Theory
VIS 157	Video History and Criticism
VIS 158	Histories of Photography
VIS 194	Fantasy in Film
MUS 111	Topics/World Music Traditions
MUS 114	Music of the Twentieth Century

Senior Project

Two courses required

ICAM 160A	Senior Project in Computer Arts I

ICAM 160B Senior Project in Computer Arts II

NOTE: Enrollment in production courses is limited to two per quarter. Production courses are numbered VIS 109, 131, 132, 140/ICAM 101, 141A-B, 145A/ICAM 102, 145B, 147A-B, 174. ICAM 120, 160A-B.

Admission to the ICAM Major and to the Media Major with Computing Emphasis

Student interest in the interdisciplinary computing and the arts major (ICAM) and the media major with computing emphasis has been strong. Because the department has limited resources to accommodate student demand, it is necessary to limit admission to these majors to the most highly qualified students. Any student admitted to UCSD beginning in fall 2002 who wishes to declare either an ICAM major or media major with computing emphasis will be admitted to the pre-major.

ICAM MAJOR

Freshman students designated as pre-majors in ICAM must complete the following eight required lower-division courses within six quarters (by the end of their sophomore year):

MUS 4	Introduction to Western Music
VIS 1	Introduction to Art-Making: Two-Dimensional Practices
ICAM 40/ VIS 40	Introduction to Computing in the Arts
MATH 20A**	Calculus
MATH 20B**	Calculus
CSE 11*	Introduction to Computer Science: JAVA
VIS 22	Formations of Modern Art
VIS 70N	Introduction to Media

*CSE 11 is an accelerated course in the JAVA programming language. CSE 8A and CSE 8B, which cover the same material in a non-accelerated format, may be substituted.

** MATH 20A and 20B are accelerated calculus courses for Science and Engineering. MATH 10A, 10B, and 10C, which cover similar material in a non-accelerated format, may be substituted.

MEDIA MAJOR WITH COMPUTING EMPHASIS

Freshman students designated as pre-majors in media with computing emphasis must complete the following six required lower-division courses within six quarters (i.e., by the end of their sophomore year):

Group A (3 courses)

VIS 1	Introduction to Art-Making: Two-Dimensional Practices,
or	
VIS 2	Introduction to Art-Making: Motion and Time-Based Art,
or	
VIS 3	Introduction to Art-Making: Three-Dimensional Practices
VIS 22	Formations of Modern Art
VIS 84	History of Film

Group B (3 courses)

VIS 40/ ICAM 40	Introduction to Computing in the Arts
VIS 60	Introduction to Photography
VIS 70N	Introduction to Media

APPLYING TO THE MAJORS

Upon completion of these courses, pre-majors seeking entrance into either major must formally apply at the Department of Visual Arts Undergraduate Program Office. Admission to the majors will be based on the following criteria: 1) Performance in the required lower-division courses as measured by GPA of 3.0 or higher, determined by the department on an annual basis; 2) Submission of a portfolio of work acceptable to the department; and 3) An artistic statement. The portfolio for both majors will consist of at least two projects that the student has produced in ICAM 40/VIS 40, in another digital arts class, or independently, that in the faculty's judgment demonstrate that the student possesses the artistic ability and technical skills to perform at a high level in upper-division courses in the majors. Pre-majors should consult the undergraduate staff adviser as to the form in which projects should be submitted (disk, slides, tapes, etc.).

TRANSFER STUDENTS

Beginning in fall 2002, transfer students who wish to declare an ICAM major or media with computing emphasis are subject to the major's admissions policies: that is, they will be admitted initially as pre-majors, apply to the major on the same basis as other students, and be subject to the same requirements with respect to lower-division courses, grade-point average, and portfolio evaluation. Transfers entering with 36 or more quarter units must apply for admission to the major no later than their third quarter of study at UCSD. At the time of admission to the pre-major, transfer students' transcripts will be evaluated by the department to determine what courses completed elsewhere, if any, may be petitioned as equivalent to required courses. Students should be prepared to provide course descriptions and other materials that may be required to determine the content of such courses.

CONTINUING STUDENTS (STUDENTS ADMITTED PRIOR TO FALL 2002)

Any student admitted to UCSD before fall 2002 may declare an ICAM major or media major with computing emphasis by completing a Change of Major form at the Visual Arts Undergraduate Program Office, attending a departmental orientation meeting, and obtaining a department stamp.

Policies Relating to the ICAM Major and the Media Major with Computing Emphasis

SATISFACTORY PROGRESS

Any ICAM major or media major with computing emphasis whose GPA in courses required for the major drops below 2.0 will be placed on probationary status the following quarter. If, during that probationary quarter, the GPA does not move back to up 2.0 or better, he or she will be dropped from the major.

PREREQUISITES

Students are required to complete all prerequisites prior to enrolling in any course required for the major. Exceptions must be negotiated with the instructor of the course in question, in consultation with a visual arts adviser.

LIMITATIONS TO ENROLLMENT BY NON-MAJORS

A department stamp is required for all upper-division courses in computing in the arts. Because ICAM and media with computing emphasis are impacted majors, first preference in enrollment in upper-division computing in the arts will be given to those two majors and to music majors with a technology concentration. Second preference will be given to other visual arts and music majors. Other students will be admitted to these courses only if space is available.

Master of Fine Arts Program

The program is designed to provide intensive professional training for the student who proposes to pursue a career within the field of art—including art making, criticism, and theory. The scope of the UCSD program includes painting, sculpture, performance, installation art, photography, film, video, and digital media. The program is unique in that the course of study provides for and encourages student mobility within this range of traditional and media-based components. It also offers opportunities for collaborative work.

The educational path of students is focused around their particular interests in art. The department seeks to provide an integrated and comprehensive introduction to the possibilities of contemporary art production, the intellectual structures which underlie them, and the "world view" which they entail. All art-making activities are considered serious intellectual endeavors, and all students in the program find themselves confronted by the need to develop their intellectual and critical abilities in working out their artistic positions. A body of theory-oriented courses is required. Therefore, we have no craft-oriented programs or facilities; nor do we have any courses in art education or art therapy. The courses offered are intended to develop in the student a coherent and informed understanding of the past and recent developments in art and art theory. The program also provides for establishing a confident grasp of contemporary technological possibilities, including those involved in film, video, photography, and the electronic media.

The program includes formal education in lecture and seminar courses as well as study groups, studio meetings, and quarterly departmental critiques. Course work is intended to place art making in critical and intellectual context but doesn't underestimate the central importance of the student's own work. In fact, this aspect of the student's activity is expected to be self-motivated and forms the core around which the program of study operates and makes sense.

No two students will necessarily follow the same path through the degree program, and the constitution of individual programs will depend upon the analysis of their individual needs and interests, worked out by students in collaboration with their individual faculty advisers.

Admission Requirements

Grade-Point Average—An overall GPA of 3.00 and a 3.50 in a student's undergraduate major is required.

Art History—Students are expected to have had at least four semester courses or six quarter courses in art history and/or film history/criticism at the undergraduate level. Those who have a broader art history background will have a better chance of being awarded teaching assistantships. Students without this requirement can be admitted, but they may be expected to make up the six courses in excess of the seventy-two units required for the degree. If there are questions concerning this requirement, check with the department.

Statement—Students are required to submit an essay of one-to-three pages on the direction of their work and its relationship to contemporary art. This essay should be critical in nature, refer explicitly to the student's own work, and may refer to other artists, recent events in art history, and issues in domains other than art that have bearing on the student's process, thought, and work.

Work—Students are asked to submit documentation of their best work in a suitable format such as slides, videotape, film, diskettes, CD, DVD, photographs, etc. These will be returned upon review of the application. It is necessary to include a self-addressed, stamped envelope for return of work.

Regular University Admission Policies

Please note that no application will be processed until all required information has been received. Students should submit applications with the application fee to the graduate admissions office using the UCSD online application on or before Thursday, January 15, 2005. Portfolio, statement, letters of recommendation, and official transcripts should be sent directly to the department.

Requirements for the Degree

The M.F.A. is considered the terminal degree in studio work, and is a two- to three-year program. The following requirements must be completed in order to receive the M.F.A.:

First Year Review—This review takes place in the third quarter in residence. Students make a formal presentation of their work to a faculty committee; this includes a position paper and an oral examination. This presentation is considered a departmental examination, and if at its conclusion the student's work is judged to be inadequate, the student may be dismissed regardless of GPA, or may be reviewed again in the fourth quarter.

Seventy-two units of course work, including a four-unit apprentice teaching course, are required. Students may select sixteen of these units (four courses) from upper-division undergraduate course offerings. (See listings in this catalog.) There are six required Visual Arts core seminars:

- Introduction to Graduate Studies in the Visual Arts (VIS 200)
- Contemporary Critical Issues (VIS 201)
- Art Practice Seminar (VIS 202)
- Working Critique Seminar (VIS 203)
- Introduction to Graduate Studies in Art Practice (VIS 205)
- one course in either Art Practice/Theory group or the Art History/Theory/Criticism group

Specific information on other course distribution requirements can be obtained from the department. One additional graduate course is required and must be taken in another department.

Students who remain registered in the third (optional) year must average one graduate course per quarter.

The M.F.A. Final Presentation

Presentation of Work—During the last quarter in residence, each student is required to present to the public a coherent exhibition or screening of his or her work.

Oral Examination—A committee of three Department of Visual Arts faculty members and one faculty member from another department will administer an oral examination to each student covering the student's work and its relationship to the field of art.

Thesis—Students are required to submit some form of written work for the M.F.A. degree. Four options are available:

1. Catalog—The student would design and have printed an actual catalog. This would include a critical essay of approximately 1,500 words.

2. Critical paper—The student would write a critical paper of 3,000 words analyzing his or her process and the relationship of his or her work to recent art history, with references to contemporary styles and specific artists.
3. Analytical essay on some phase of art—Students who have focused on both art production and art criticism would write a 3,000 word critical essay on any current art position. A brief discussion (750 words) of the student's work would also be included.
4. Critical thesis—Students whose emphasis is essentially criticism and who do not present an M.F.A. exhibition would write a forty- to fifty-page thesis—the topic to be decided by the student and his or her adviser.

Applications and additional information can be obtained from the graduate office of the Department of Visual Arts.

Ph.D. Program

The Department of Visual Arts offers the Ph.D. and M.A. degrees in art history, theory, and criticism with concentrations in any of the areas in which faculty do research (see below). Offering a distinct alternative to existing Ph.D. programs in art history, the program centers on a unique curriculum that places art objects and practice at the center of inquiry, both past and present, and encompassing fine art, media, and mass culture, even as it encourages examination of the larger frameworks—historical, cultural, social, intellectual, and theoretical—within which the category "art" has been contextualized in the most recent developments in the discipline.

This program is also distinctive in that it is housed within a department that has been for many years one of the nation's leading centers of art practice and graduate education in studio, media, and—most recently—digital media. The offering of the Ph.D. and M.F.A. degrees is based on the department's foundational premise that the production of art and the critical, theoretical, and historical reflection upon it inherently and necessarily participate in a single discursive community.

The innovative character of this program is most evident in a unique curricular structure that is broadly organized into three groups of seminars. The importance of critical theory to the field today is reflected in the seminars under the **Theories/New Visions** group, while the study of art in its concrete historical, social, and cultural contexts, across different cultures and media, is emphasized in time, place, and media specific seminars listed under **Times/Terrains**.

The program builds most distinctively on recent developments in the field in the seminars under the heading **Categories/Constructs.** These seminars address the core questions about artworks and practices that the department believes every doctoral student in art and media history, whatever his or her area of specialization, should engage. How is the category "art" itself produced, now and in the past, in the urbanized west and in other cultures, and in the context of ever-changing technologies? How are artistic identities constructed across distinct epochs and societies, and with reference to categories such as gender and ethnicity? What are the circumstances and contexts (social, intellectual, institutional, and the like) within which art is both produced and disseminated? What are the alternative modes of engaging art objects and practices and what are the histories and theoretical assumptions of the specialized discourses used to describe and analyze them?

Seminars in the **Categories/Constructs** group are unique in the degree to which they foreground the self-critical turn in recent art and media history by making reflection upon the central concepts, constructs, categories, and languages of art historical inquiry a key programmatic concern. They are also distinctive in that they are designed to cut across traditional categories of history and contemporaneity, art and media (film, video, photography, digital media), history and theory, and to promote cross-cultural inquiry insofar as they center on questions crucial to the study of art of diverse cultures as well as diverse art forms and historical epochs.

Admission

Applicants may apply to the Ph.D. program only. The policy of UCSD is to admit in the fall quarter only. Applications for admission must be postmarked January 15, and selections will be made by April 1. For circumstances under which the M.A. is granted, see below. Prior to matriculation, students must have obtained a bachelor's or master's degree in art history, art practice, or another field approved by the departmental committee on graduate studies, such as (but not limited to) history, literature, anthropology, or philosophy.

Applicants must submit their academic transcripts, scores on the Graduate Record Examination, three letters of recommendation, a statement of purpose (no more than 750 words), and a sample of written work (e.g., senior honors thesis, M.A. thesis, or other research or critical paper, preferably in art or media history). An overall GPA of 3.00 and a 3.50 in a student's undergraduate major are required. The Test of English as a Foreign Language (TOEFL) is required for international applicants. Applicants must have a good reading knowledge of at least one of the foreign languages required for graduate study, normally either French or German, at the time they enter the program.

Please note that no application will be processed until all required information has been received. Students should submit applications with the application fee to the graduate admissions office on or before Thursday, January 15, 2005. Statements of purpose, writing samples, and letters of recommendation should be sent directly to the department.

Areas of Concentration

During the first year of study, each student must declare an area of major concentration in consultation with his or her individual faculty adviser and with the approval of the Ph.D. graduate adviser. The major concentration may be selected from the following: ancient art; medieval art; renaissance art; early modern art; modern art (nineteenth and twentieth centuries); contemporary art; media studies (film, video, photograph, digital media); and Meso-American art. A student may also choose, in consultation with his or her adviser and the Ph.D. graduate adviser, a field of emphasis that cuts across the areas within the department (e.g., art or media theory and criticism) or, with appropriate approvals, one that involves another department (e.g., early modern art history and history). Once the field of emphasis is established, it will be the responsibility of the student and his or her adviser to devise a program of courses, independent study and outside reading, over and above the required program, that will ensure that the student will attain command of the major field of emphasis.

Course Work

A normal full-time program consists of 12 units per quarter. Prior to the qualifying examination, students will be expected to complete 84 units, equivalent to 21 four-unit courses (normally accomplished in seven to nine quarters). This 21-course requirement will normally be satisfied by a combination of graduate seminars, reading courses, independent study, and apprentice teaching. No more than three may be apprentice teaching; no more than two may be reading courses; and no more than two may be graduate seminars in art practice or art practice/theory. By reading course, we mean an upper-division undergraduate course which a student takes with additional reading and writing requirements. Full-time study is expected; part-time study will be considered on a case-by-case basis and for a limited time. Graduate seminars in Art History, Theory, and Criticism should comprise the bulk of the student's twenty-one-course requirement.

All students are required to take the following seminars in their first year of study: VIS 200 Introduction to Graduate Studies in Visual Art (offered in fall only) and VIS 204 Re-Thinking Art History. Students must also take, at some point, one seminar from the Art Practice/Theory group, VIS 210-VIS 219. One four-unit apprentice teaching course is also required.

In order to ensure that students attain a reasonable measure of historical and cultural breadth, all students are required to take one seminar from at least four of the following areas: 1) ancient or medieval art; 2) renaissance or early modern art; 3) modern or contemporary art; 4) media studies; 5) non-western art.

If a student has completed some graduate work in art history, theory, and criticism before entering UCSD, there may be some appropriate adjustments in course work as approved by petition to the Ph.D. graduate adviser and the department chair.

Foreign Language Requirements

Students will be required to demonstrate reading knowledge of at least two of the foreign languages required for advanced study in art history, theory, and criticism. Normally one of these should be either French or German, and the other should be the language most directly relevant to the student's area of specialization. The student and his or her individual adviser will jointly determine the examination languages.

Foreign language requirements will normally be satisfied by passing examinations requiring sight translation of texts in art history, theory, and criticism. No student who has not passed one such examination will be admitted to second-year study, and no student who has not passed two will be admitted to third-year study.

Examinations

No later than the first quarter of the third year, the student, in consultation with his or her individual adviser, will form a qualifying examination committee which will consist of at least three members drawn from the visual arts department faculty and one drawn from another department. This committee will conduct the qualifying examination required by university policy and oversee completion of the dissertation. The membership of the committee must be approved by the Ph.D. graduate adviser and ultimately the dean of Graduate Studies. The qualifying examination will consist of a three-hour written examination, followed within the next two days by a two-hour oral examination, in the student's major field. A student must have completed all required course work and passed all language examinations before taking the qualifying examination, which will be held no later than the end of the third year. Upon successful completion of the qualifying examination, the student will be advanced to candidacy.

A student who fails either the written or the oral examination may petition the committee and Ph.D. graduate adviser to repeat the examination. Any student who fails a second time will not be advanced to candidacy. In some cases, the committee and graduate program director may judge such student eligible to receive a terminal M.A. (see below).

Dissertation

Following successful completion of the qualifying examinations, the student will complete a doctoral dissertation in his or her field of emphasis. Upon selection of the dissertation topic, a colloquium will be held at which the student will present a prospectus that outlines the topic and program of research for discussion by the graduate group and for approval by his or her committee. After the committee has reviewed the finished dissertation, the student will defend his or her thesis orally. In exceptional cases, the thesis defense may be waived by unanimous agreement of the committee members and the Ph.D. graduate adviser.

Normative Time from Matriculation to Degree

The student will normally advance to candidacy in two and one-half to three years and must be advanced to candidacy by the end of four years. He or she will normally complete the research for and writing of the dissertation by the end of his or her sixth year of study. Total university support may not exceed seven years, and total registered time at UCSD may not exceed eight years.

M.A. Degree

All students will apply for and be admitted to the Ph.D. program. An M.A. degree may be awarded to continuing Ph.D. students upon successful completion of the following: (1) at least 12 four-unit courses, including VIS 200 *Introduction to Graduate Studies in Visual Art*, VIS 204 *Re-Thinking Art History*, and one seminar from the group VIS 210-219; (2) a three-hour written examination in a designated field of emphasis (see **Examinations** above); (3) one language examination; and (4) an M.A. thesis. The M.A. is not automatically awarded; students must apply in advance to the Ph.D. graduate adviser and in accordance with university procedures, no later than the first two weeks of the quarter in which they expect to receive the degree.

Students who demonstrate minimal competence on the qualifying examination, but not sufficient competence to continue in the program, may be awarded a terminal M.A. upon completion of the requirements set forth in the paragraph above.

COURSES

Note: The following list of courses represents all visual arts offerings; not all courses are offered each year.

LOWER-DIVISION

1. Introduction to Art-Making: Two-Dimensional Practices (4)
An introduction to the concepts and techniques of art making with specific reference to the artists and issues

of the twentieth century. Lectures and studio classes will examine the nature of images in relation to various themes. Drawing, painting, found objects, and texts will be employed. *Prerequisite: none.* This course is offered only one time each year.

2. Introduction to Art Making: Motion and Time Based Art (4)
An introduction to the process of art making utilizing the transaction between people, objects, and situations. Includes both critical reflection on relevant aspects of avant-garde art of the last two decades (Duchamp, Cage, Rauschenberg, Gertrude Stein, conceptual art, happenings, etc.) and practical experience in a variety of artistic exercises. This course is offered only one time each year.

3. Introduction to Art-Making: Three-Dimensional Practices (4)
An introduction to art making that uses as its base the idea of the "conceptual." The lecture exists as a bank of knowledge about various art world and non-art world conceptual plays. The studio section attempts to incorporate these ideas into individual and group projects using any "material." This course is offered only one time each year.

20. Introduction to Art History (4)
This course examines history of Western art and architecture through such defining issues as the respective roles of tradition and innovation in the production and appreciation of art; the relation of art to its broader intellectual and historical contexts; and the changing concepts of the monument, the artist, meaning, style, and "art" itself. Representative examples will be selected from different periods, ranging from Antiquity to Modern. Content will vary with the instructor. *Prerequisite: none.*

21. Introduction to Non-Western Art (4)
This course offers a comparative and thematic approach to the artistic achievements and cultural productions of societies with widely divergent structure and political organization from the ancient kingdoms and empires of Central America and Asia to the tribes of Africa and the chiefdoms of Native American and Oceanic peoples. Topics vary with the interests and expertise of the instructor. *Prerequisite: none.*

22. Formations of Modern Art (4)
Wide-ranging survey introducing the key aspects of modern art and criticism in the nineteenth and twentieth centuries, including Neo-Classicism, Romanticism, Realism, Impressionism, Post-Impressionism, Symbolism, Fauvism, Cubism, Dada and Surrealism, Abstract Expressionism, Minimalism, Earth Art, and Conceptual Art. *Prerequisite: none.*

23. Information Technologies in Art History (4)
This seminar introduces fundamentals of art historical practice such as descriptive and analytical writing, compiling annotated bibliographies with traditional and online resources, defining research topics, and writing project proposals. *Prerequisite: none.*

Note: Prerequisite for VIS 112 and highly recommended for all other seminars. Must be taken within a year of declaring major or transferring into the art history program.

40. Introduction to Computing in the Arts (4)
(Cross-listed with ICAM 40.) An introduction to the conceptual uses and historical precedents for the use of computers in art making. Preparation for further study in the computer arts area by providing overview of theoretical issues related to the use of computers by artists. Introduces the students to the program's computer facilities and teaches them basic computer skills. *Prerequisite: open to visual arts and ICAM majors and minors only.* Materials fee required.

60. Introduction to Photography (4)
An in-depth exploration of the camera, combining darkroom techniques in black and white, and color photography. Emphasis is placed on developing reliable control of the fundamental materials and procedures through lectures, field, and lab experience. Basic discussion of image making included. *Prerequisite: open to visual arts art history, ICAM, media, studio, and music ICAM majors and minors only.* Materials fee required.

70N. Introduction to Media (6)
Operating as both a lecture and production course, this introductory class provides a technical foundation and theoretical context for all subsequent production-oriented film and video studies. In the laboratory, the student will learn the basic skills necessary to initiate video production. Completion of Visual Arts 70N is necessary to obtain a media card. *Prerequisite: none.* Materials fee required.

84. History of Film (4)
A survey of the history and the art of the cinema. The course will stress the origins of cinema and the contributions of the earliest filmmakers, including those of Europe, Russia, and the United States. Materials fee required. This course is offered only one time each year.

87. Freshman Seminar (1)
The Freshman Seminar program is designed to provide new students with the opportunity to explore an intellectual topic with a faculty member in a small seminar setting. Freshman seminars are offered in all campus departments and undergraduate colleges, and topics vary from quarter to quarter. Enrollment is limited to fifteen to twenty students with preference given to entering freshmen.

UPPER-DIVISION

104A. Performing the Self (4)
Using autobiography, dream, confession, fantasy, or other means to invent one's self in a new way, or to evoke the variety of selves in our imagination, the course experiments with and explores the rich possibilities available to the contemporary artist in his or her own persona. *Prerequisites: two from VIS 1, 2, 3 and either 22 or 111.*

104BN. Verbal Performance (4)
The course is designed to introduce the student to the part played by language in contemporary performance art. Monologues, musically derived sound poetry, vocalizations, verbally inscribed installations, and the uses of language and voice in film and video are some of the areas explored. *Prerequisite: VIS 104A.*

104CN. Personal Narrative (4)
The course will explore primary experiential materials to more fully understand the relationship of voice, style, language, and personality, to issues of memory, identity, self-awareness, and desire. Instructor and student will discuss student work as well as published personal narrative. *Prerequisite: VIS 104BN.*

105A. Drawing: Representing the Subject (4)
A studio course in beginning drawing covering basic drawing and composition. These concepts will be introduced by the use of models, still life, landscapes, and conceptual projects. *Prerequisites: two from VIS 1, 2, 3 and either 22 or 111.*

105B. Drawing: Practices and Genre (4)
A continuation of VIS 105A. A studio course in which the student will investigate a wider variety of technical and conceptual issues involved in contemporary art practice related to drawing. *Prerequisite: VIS 105A.*

105C. Drawing: Portfolio Projects (4)
A studio course in drawing, emphasizing individual creative problems. Class projects, discussions, and critiques will focus on issues related to intention, subject matter, and context. *Prerequisite: VIS 105B.*

105D. The Aesthetics of Chinese Calligraphy (4)
This course examines Chinese calligraphy as an art form. This conceptually based introductory course combines fundamental studio exercises with creative explorations. Students are exposed to traditional and contemporary forms of Chinese calligraphy while encouraged to experiment with basic aesthetic grammars. *Prerequisite: VIS 105A.*

105E. Chinese Calligraphy as Installation (4)
This course concerns East–West aesthetic interactions. What are the conceptual possibilities when calligraphy, an ancient form of Chinese art, is combined with installation, a contemporary artistic Western practice? Emphasis is placed on such issues as cultural hybridity, globalization, multiculturalism, and commercialization. *Prerequisite: VIS 105D.*

106A. Painting: Image Making (4)
A studio course focusing on problems inherent in painting—transferring information and ideas onto a two-dimensional surface, color, composition, as well as manual and technical procedures. These concepts will be explored through the use of models, still life, and landscapes. *Prerequisites: two from VIS 1, 2, 3 and either 22 or 111.*

106B. Painting: Practices and Genre (4)
A continuation of VIS 106A. A studio course in which the student will investigate a wider variety of technical and conceptual issues involved in contemporary art practice related to painting. *Prerequisite: VIS 106A.*

106C. Painting: Portfolio Projects (4)
A studio course in painting emphasizing individual creative problems. Class projects, discussions, and critiques will focus on issues related to intention, subject matter, and context. *Prerequisite: VIS 106B.*

107A. Sculpture: Making the Object (4)
A studio course focusing on the problems involved in transferring ideas and information into three-dimensions. Course will explore materials and construction as dictated by the intended object. Specific problems to be investigated will be determined by the individual professor. *Prerequisites: two from VIS 1, 2, 3 and either 22 or 111.*

107B. Sculpture: Practices and Genre (4)
A studio course in which the student will investigate a wider variety of technical and conceptual issues as well as materials involved in contemporary art practice related to sculpture. *Prerequisite: VIS 107A.*

107CN. Sculpture: Portfolio Projects (4)
A studio course in sculpture emphasizing individual creative problems. Class projects, discussions, and critiques will focus on issues related to intention, subject matter, and context. *Prerequisite: VIS 107B.*

108. Advanced Projects in Art (4)
A studio course for serious art students at the advanced level. Stress will be placed on individual creative problems. Specific orientation of this course will vary with the instructor. Topics may include film, video, photography, painting, performance, etc. May be repeated twice for credit. *Prerequisite: consent of instructor, department stamp required.*

109. Advanced Projects in Media (4)
Individual or group projects over one or two quarters. Specific project organized by the student(s) will be realized during this course with instructor acting as a close adviser/critic. Concept papers/scripts must be completed by the instructor prior to enrollment. *Prerequisites: VIS 180A and VIS 180B for media majors, or consent of instructor for ICAM majors. Open to media and ICAM majors only.* Two production course limitation.

110A. Contemporary Issues and Practices (4)
An examination of contemporary studio art practice. The course is divided among research, discussion, and projects. Field trips to galleries and discussions with artists will combine with the students moving their work into a dialogue with the issues raised. *Prerequisites: two from VIS 104CN, 105C, 106C, 107CN and 147B or consent of instructor.*

110B. New Genre/New and Old Technologies (4)
Advances the idea of different materials, methods, and practices raised at the intermediate level in drawing, painting, and sculpture, and explores and utilizes new and traditional media in studio production of work. Emphasis on multiple media, combining traditional and electronic media, as well as different genres, in an attempt to create new directions for the student's ideas. *Prerequisites: two from VIS 104CN, 105C, 106C, 107CN and 147B or consent of instructor.*

110C. Proposals, Plans, Presentations (4)
Explores the use of the maquette, or sketch, in the process of developing, proposing and planning visual works in various media for public projects, site specific works, grants, exhibition proposals, etc. The student will work on synthesizing ideas and representing them in alternate forms that deal with conception, fabrication and presentation. *Prerequisites: two from VIS 104CN, 105C, 106C, 107CN and 147B or consent of instructor.*

110D. Visual Narrative/Tableau (4)
Examination and use of multi-media in exploring narrative issues in art making. The identification of subject leads to the determination of choice or mix of media and construction of narrative. Traditional studio practice surrounding narrative painting and sculpture, forms such as comic drawing or story boards, and the use of photo, video, and computing. *Prerequisites: two from VIS 104CN, 105C, 106C, 107CN and 147B or consent of instructor.*

110F. Installation: Cross-Disciplinary Projects (4)
Attempts to expand the idea contained in a singular work, or object, into the use of multiple objects, images, and media that redefines the idea as well as the space for which it is intended. Examination of historic, modern, and contemporary works would be brought into discussion of project development and execution. *Prerequisites: two from VIS 104CN, 105C, 106C, 107CN and 147B or consent of instructor.*

110G. The Natural and Altered Environment (4)
Explores the natural and altered environment as a basis for subject as well as placement of work pertaining to the environment. *Prerequisites: two from VIS 104CN, 105C, 106C, 107CN and 147B or consent of instructor.*

110H. Image and Text Art (4)
Devoted to the study and practice of the multiple ways in which writing and other forms of visible language have been incorporated into contemporary and traditional artworks, including artists' books, collaging and poster art, visual and concrete poetry, typographical experiments, and calligraphies. *Prerequisites: two from VIS 104CN, 105C, 106C, 107CN and 147B or consent of instructor.*

110I. Performing for the Camera (4)
The dematerialization of the performer into a media based image—video, film, slides, still photographs, using the camera as a spy, a co-conspirator, a friend or a foe—employing time lags, spatial derangement, image deconstruction, along with narrative, text, history, to invent time based pieces that break new ground while being firmly rooted in an understanding of the rich body of work done in this area over the last three decades. *Prerequisites: two from VIS 104CN, 105C, 106C, 107CN and 147B or consent of instructor.*

110J. Ritual Performance (4)
The course will explore forms of art making that use dream and myth, body art, dance, social drama, happenings, story telling, and enactments of contemporary and traditional forms of performance art that involve a crossing of the lines between different arts and genres. *Prerequisites: two from VIS 104CN, 105C, 106C, 107CN and 147B or consent of instructor.*

110K. Installation Performance (4)
The artist as performer working with materials, objects, props, technology, to create multi-layered, experimental, interesting three-dimensional art spaces in which the artist's body, voice, actions, or memory, moves through, enlivens, or haunts the physical space. *Prerequisites: two from VIS 104CN, 105C, 106C, 107CN and 147B or consent of instructor.*

110M. Studio Honors I (4)
An advanced studio course intended for the productive, motivated, and self-disciplined student with a clear and unified body of work. The intent is to help refine and expand the student's work and ideas towards an exhibition and verbal written position. *Prerequisite: consent of the instructor, department stamp required.* **Note:** The Studio Honors I and the attached Studio Honors II count as one course toward the fulfillment of a Group IV requirement.

110N. Studio Honors II (4)
The second advanced studio course in the Honors Program in Studio, the successful completion of which will lead towards an honors degree in the studio major. The course builds on the critical and technical issues raised in Studio Honors I. *Prerequisite: VIS 110M.*

111. The Structure of Art (4)
This course will address the structure of signification in art. We will consider the modes of signification in a wide range of representational and nonrepresentational artworks from architecture through drawing, painting, sculpture, photography, video, and film to performance. Examples will be selected from various places and epochs. This course is required for transfer students. This course is offered during spring quarter only.

112. Art Historical Methods (4)
A critical review of the principal strategies of investigation in past and present art-historical practice, a scrutiny of their contexts and underlying assumptions, and a look at alternative possibilities. The various traditions for formal and iconographic analysis as well as the categories of historical description will be studied. Required for all art history and criticism majors. *Prerequisites: VIS 23 and one upper-division art history course; two recommended.*

113AN. History of Criticism I: Early Modern (4)
Introducing Classical Medieval and Renaissance theories of the image, we concentrate on developments in the eighteenth and nineteenth centuries: Neo-Classicism, Romanticism, Realism, and Symbolism. *Prerequisite: upper-division sanding; VIS 112 or two upper-division courses in art history strongly recommended.*

113BN. History of Criticism II: Early Twentieth Century (1900–1950) (4)
The principal theories of art and criticism from Symbolism until 1945: formalism and modernism, abstraction, Surrealism, Marxism, and social art histories, phenomenology, existentialism. *Prerequisite: none; VIS 112 or two upper-division courses in art history strongly recommended.*

113CN. History of Criticism III: Contemporary (1950–Present) (4)
Recent approaches to the image in art history and visual culture: structuralism, semiotics, psychoanalysis, post-structuralism, post-modernism, feminism, post-colonialism, cultural studies. *Prerequisite: none; VIS 112 or two upper-division courses in art history strongly recommended.*

117A. Narrative Structures (4)
How can a fixed image represent events in time? The strategies of storytelling and their consequences for the meaning of works of art will be investigated. Content of the course will vary. May be repeated twice for credit with permission of the instructor. *Prerequisite: none; VIS 112 or two upper-division courses in art history strongly recommended.*

117B. Theories of Representation (4)
A discussion of major Western theories of representation with a critique of their applicability to art. Material is drawn from a wide variety of historical periods from Antiquity to Modern. Emphasis is given to theories special significance for art history, but some attention is given to representation theories in other contexts. Readings may include selections from such modern theorists as Peirce, Panofsky, Gombrich, Bernheimer, Barfield, Barthes, Goodman, Foucault, Bryson, Summers, and Mitchell and from classic texts by Plato, Aristotle, John of Damascus, Alberti, and Leonardo. *Prerequisite: none; one or more upper-division courses in art history strongly recommended.* **Note:** Majors must have taken VIS 23.

117C. Art in Time: The Historical Dimensions (4)
How does a work of art live in time? What connects it with art past, present, and future? Where does tradition and innovation intersect? Why is past art always an issue for contemporary practice? This seminar considers these and other questions as well as different theoretical models for understanding art's historical dimension. Specific issues and readings may vary from year to year. *Prerequisite: none; VIS 112 or two upper-division courses in art history strongly recommended.*

117D. Portraiture (4)
Portraiture appeals to the human interest in human beings. This seminar explores how portraits from dif-

ferent periods (potentially ancient through modern) reflect cultural ideas about citizens even as they purport to convey actual appearances. Content may vary with instructor. *Prerequisite: none; VIS 112 or two upper-division courses in art history strongly recommended.*

117E. Problems in Ethnoaesthetics (4)
This seminar will address and critique various approaches to studying the art of non-Western societies with respect to their own aesthetic and cultural systems. Students are encouraged to explore comparative philosophies of art and test paradigms of Western aesthetic scholarship. *Prerequisite: none; VIS 21 or 112 or two upper-division courses in art history strongly recommended.*

120A. Greek Art (4)
Greek classical civilization was a turning point in the history of humanity. Within a new kind of society, the idea of the individual as free and responsible was forged, and with it the invention of history, philosophy, tragedy, and science. The arts which expressed this cultural explosion were no less revolutionary. The achievements of Greek art in architecture, sculpture, and painting will be examined from their beginnings in the archaic period, to their epoch-making fulfillment in the classical decades of the fifth century B.C., to their diffusion over the entire ancient world in the age of Alexander and his successors. *Prerequisite: none; VIS 20 recommended.*

120B. Roman Art (4)
Roman art was the "modern art" of antiquity. Out of their Italic tradition and the great inheritance of Greek classic and Hellenistic art, the Romans forged a new language of form to meet the needs of a vast empire, a complex and tumultuous society, and a sophisticated, intellectually diverse culture. An unprecedented architecture of shaped space used new materials and revolutionary engineering techniques in boldly functional ways for purposes of psychological control and symbolic assertion. Sculpture in the round and in relief was pictorialized to gain spatial effects and immediacy of presence, and an extraordinary art of portraiture investigated the psychology while asserting the status claims of the individual. Extreme shifts of style, from the classicism of the age of Augustus to the expressionism of the third century A.D., are characteristic of this period. The new modes of architecture, sculpture, and painting, whether in the service of the rhetoric of state power or of the individual quest for meaning, were passed on to the medieval and ultimately to the modern West. *Prerequisite: none; VIS 20 recommended.*

120C. Late Antique Art (4)
During the later centuries of the Roman Empire, the ancient world underwent a profound crisis. Beset by barbarian invasions, torn by internal conflict and drastic social change, inflamed with religious passion which was to lead to a transformed vision of the individual, the world, and the divine, this momentous age saw the conversion of the Roman world to Christianity, the transfer of power from Rome to Constantinople, and the creation of a new society and culture. Out of this ferment, during the centuries from Constantine to Justinian, there emerged new art forms fit to represent the new vision of an otherworldly reality: a vaulted architecture of diaphanous space, a new art of mosaic which dissolved surfaces in light, a figural language both abstractly symbolic and urgently expressive. The great creative epoch transformed the heritage of classical Greco-Roman art and laid the foundations of the art of the Christian West and Moslem East for the next thousand years. *Prerequisite: none; VIS 20 or 120B recommended.*

120D. Prehistoric Art (4)
Tens of thousands of years before the dawn of history, the hunting peoples of Ice Age Europe invented the first language of visual images. Their painted cave sanctuaries, such as Lascaux and Altamira, are dazzling in their expressive vitality and mystifying in meaning. This course link cave art with what is known about contemporary conditions of nature, society, and human life. *Prerequisite: none; VIS 20 recommended.*

121AN. The Idea of Medieval Art (4)
This course introduces the art and architecture of Western Europe from the fourth through the thirteenth centuries. A leading theme is the changing idea of what "medieval" has come to mean, from the coining of the terms "Middle Ages" and "Dark Ages" by Renaissance humanists, to the Romantic fascination with Gothic ruins, and finally to the fantasy medievalisms of twentieth century popular culture and current approaches to medieval art in art historical scholarship. *Prerequisite: none; VIS 20 recommended*

121B. Castles, Cathedrals, and Cities (4)
This course explores European art and architecture of the twelfth- through the fourteenth-centuries against the background of the rituals of chivalry, church, and civic life that made a dazzling spectacle of art and life in the High Middle Ages. *Prerequisite: upper-division standing; VIS 20 recommended.*

121C. Art and Gender in the Middle Ages and Renaissance (4)
This seminar explores how different representational traditions involving women and men reflected but also contributed to the formation of period beliefs about gender difference. It also considers the differential roles of women and men as producers and patrons of art and period expectations and practices involving male and female spectatorship. Specific content may vary from year to year. *Prerequisite: none; VIS 112 or two upper-division courses in art history strongly recommended.*

121D. The Illuminated Manuscript in the Middle Ages (4)
This seminar charts the changing pictorial problematics presented by the illuminated manuscript from its origins in late antiquity to the disintegration of the manuscript tradition under the impact of the first printed books. Works such as the *Book of Kells* and the *Tres Riches Heures of the Duke of Berry*, among the most brilliant achievements of Western painting, are among those considered. *Prerequisite: none; VIS 112 or two upper-division courses in art history strongly recommended.*

121E. Pursuit of the Millennium (4)
(Cross-listed with HIEU 115) The year 2000 provokes questions about the transformation of time, culture, and society. Taking the year 1000 as a touchstone, this class examines the history of apocalyptic expectations in the Middle Ages through a close scrutiny of both texts and art. *Prerequisite: none.*

122AN. Renaissance Art (4)
Italian artists and critics of the fourteenth through sixteenth centuries were convinced that they were participating in a revival of the arts unparalleled since Antiquity. Focusing primarily on Italy, this course traces the emergence in painting, sculpture and architecture, of an art based on natural philosophy, optical principles, and humanist values, which embodied the highest intellectual achievement and deepest spiritual beliefs of the age. Artists treated include Giotto, Donatello, Masaccio, Brunelleschi, Jan van Eyck, Mantegna, Botticelli, Leonardo da Vinci, Michelangelo, Raphael, Bramante, Durer, and Titian. *Prerequisite: none; VIS 20 recommended.*

122CN. Defining High Renaissance Art (4)
Since the sixteenth century, the names of Leonardo da Vinci, Raphael, and Bramante have conjured up images of the highest artistic achievement. This course shows the intellectual concerns common to the artist and scientific productions of Leonardo help illuminate the distinctive character of the art of two of his greatest contemporaries. *Prerequisite: none; VIS 20, 122AN, or 122BN recommended.*

122D. Michelangelo (4)
This course offers new approaches to understanding Michelangelo's greatest creations. By considering how each work relates to the setting for which it was intended, by regarding critical literature and artistic borrowings as evidence about the works, and by studying the thought of the spiritual reformers who counseled Michelangelo, new interpretations emerge which show the artist to be a deeply religious man who invested his works with both public and private meanings. *Prerequisite: upper-division standing; or one of the following courses: VIS 20, 21, 22 or 23; or any upper-division course in art history and criticism or in European history.*

122E. The City in Italy (4).
(Cross-listed with HIEU 124.) Each Italian city takes pride in having a style and history all its own. This lecture course, usually taught in conjunction with the history department's HIEU 124, considers various approaches to and models for understanding the social, political, economic, and artistic fabric of such renowned medieval and Renaissance cities as Rome, Florence, Venice, Naples, Milan, and Sienna. Content varies from year to year. May be repeated three times for credit. *Prerequisite: none; an upper-division course in Pre-Modern or Early Modern art history or Pre-Modern or Early Modern European history is strongly recommended.* **Note**: May be used to fulfill the seminar requirement for art history majors.

123AN. Between Spirit and Flesh: Northern Art of the Early Renaissance (4)
The art of the Early Renaissance in Northern Europe is marked by what appears to be striking conflict: on the one hand, a new love of nature and of the pleasures of court society; and on the other, an intensified spirituality and focus on personal devotion. This course explores these provocative cross-currents in works by master painters like Jan van Eyck and Hieronymous Bosch as well as in lesser known mass-produced objects of everyday use. *Prerequisite: none; VIS 20, 121AN, and/or 122AN recommended.*

123BN. Jan van Eyck (4)
Intensive study of the career of Jan van Eyck, whose magical paintings have always fascinated viewers with their microscopically detailed naturalism and subtly disguised spiritual meanings. Masterpieces such as the "Arnolfini Wedding" are emphasized. *Prerequisite: none; VIS 112 or two upper-division courses in art history recommended.*

123CN. Early Print Culture: The First Media Revolution (4)
During the fifteenth century, two inventions—printed pictures and books printed with moveable type—revolutionized both Western art making and information technologies. This seminar considers the condi-

tions that made possible this "first media revolution," its immediate impact and its continuing resonances in early modern visual culture. *Prerequisite: none; VIS 112 or two upper-division courses in art history recommended.*

124AN. Baroque Art (4)
This course discusses the achievement of such major artists as Caravaggio, Gentileschi, Bernini, Borromini, Rubens, Rembrandt, Velasquez, and Vermeer within a culture marked by increasing intellectual specialization, the entrenchment of modern national boundaries, the co-existence of rival religious organizations, the formations of artistic academies, and the rise of an art market serving the flourishing middle class. *Prerequisite: none; VIS 20 recommended.*

124BN. Art and the Enlightenment (4)
Eighteenth century artists and critics were convinced that art could be a force to improve society. This course places Roccoco and Neo-Classical artists such as Watteau, Fragonard, Tiepolo, Hogarth, Reynolds, Vigee Lebrun, Blake, and David, within the context of art academies, colonialism, the Grand Tour, Enlightenment conceptualizations of history and nature, and the American and French Revolutions. *Prerequisite: none; VIS 20 or 22 recommended.*

124CN. Nineteenth Century Art (4)
A critical survey discussing the crisis of the Enlightenment, Romanticism, Realism and Naturalism, Academic Art and History Painting, representations of the New World, the Pre-Raphaelites, Impressionism, international Symbolism, Post-Impressionism, and the beginnings of Modernism. *Prerequisite: none; VIS 20 or 22 recommended.*

125A. Twentieth Century Art (4)
A critical survey outlining the major avant-gardes after 1900: Fauvism, Cubism, Metaphysical Painting, Futurism, Dada, Surrealism, Neo-Plasticism, Purism, the Soviet avant-garde, Socialist Realism, and American art before Abstract Expressionism. *Prerequisite: none; VIS 20 or 22 recommended.*

125BN. Contemporary Art (4)
Art after Abstract Expressionism: Happenings, Post-painterly Abstraction, Minimalism, Performance, Earth Art, Conceptual Art, Neo-Expressionism, Post-Conceptualism and development in the 1990s, including non-Western contexts. We also explore the relation of these tendencies to Postmodernism, Feminism, and ideas of Postcoloniality. *Prerequisite: none; VIS 20 or 22 recommended.*

125CN. Histories and Contexts of Conceptual Art (4)
A detailed exploration of the history, theories, and social contexts of the Conceptual Art movement from mid-1960s to the 1980s. Artists/theorists discussed include Duchamp, Kosuth, Weiner, Baldessari, Barry, Piper, Darboven, Huebler, Art and Language, Beuys, Holzer, and Neo-Conceptualism. *Prerequisite: none; VIS 20 or 22 recommended.*

125DN. Marcel Duchamp (4)
A critical examination of the work of one of the most radical twentieth century artists. In Duchamp's four dimensional perspective, the ideas of art-object, artist, and art itself are deconstructed. *The Large Glass and Etant Donnees* ... are the twin foci of an *oeuvre* without boundaries in which many twentieth-century avant-garde devices such as chance techniques, conceptual art, and the fashioning of fictive identities, are invented. *Prerequisite: none.*

125E. History of Performance Art (4)
The novel, perplexing, outrageous, and witty modes of performance by such contemporary artists as Acconci, Anderson, Antin, Beuys, Jonas, Kaprow, and Lacy will be examined in the critical framework of earlier twentieth-century experiments in music, theater, and dance as well as in the visual arts. The movements of futurism, dada and surrealism, the Russian avant-garde, the Bauhaus, abstract expressionism, and happenings provide antecedents for performance art. So do the fields of anthropology, sociology, and psychology as well as the theater practices and theories of Artaud, Brecht, Piscator, Meyerhold, and Stanislavsky, and the experimental dance of Duncan, Wigman, Laban, Graham, Cunningham, and Rainer. *Prerequisite: none.*

126AN. Pre-Columbian Art of Ancient Mexico and Central America (4)
An introduction to the cities and monuments of the ancient civilizations which flourished in Mexico and Central America before the Spanish Conquest. This course will cover the major cultures of Mesoamerica, including the Olmec, Aztec, and neighboring groups. *Prerequisite: none; VIS 21 recommended.*

126BN. The Art and Civilization of the Ancient Maya (4)
This course offers a history of Maya society from its formative stages to the eve of the Spanish Conquest through an investigation of its art and archeology. Special attention is given to its unique calendar and writing systems. *Prerequisite: none; VIS 21 recommended.*

126CN. Art of the North American Indians (4)
This course discusses the artistic legacy and cultural diversity of the ancient, historic, and surviving Native American people of the United States and Canada. *Prerequisite: none; VIS 21 recommended.*

126DN. African and Afro-American Art (4)
The dynamic, expressive arts of selected West African societies and their subsequent survival and transformation in the New World will be studied. Emphasis will be placed on Afro-American modes of art and ceremony in the United States, Haiti, Brazil, and Suriname. *Prerequisite: none; VIS 21 recommended.*

126E. Oceanic Art (4)
An examination of the relation of art to ritual life, mythology, and social organization in the native Polynesian and Melanesian cultures of Hawaii, New Guinea, the Solomon Islands, and Australia. *Prerequisite: none; VIS 21 recommended.*

126F. Western and Non-Western Rituals and Ceremonies (4)
This course will examine the process of image-making within specific ceremonies and/or rituals. Selected ceremonies from West Africa, Melanesia, Nepal, and the United States, including both Christian and non-Christian imagery, will be considered. Performance art and masquerade will be analyzed within a non-Western framework. *Prerequisite: none; VIS 21 recommended.*

126G. Problems in Mesoamerican Art History (4)
Topics of this seminar will address special problems or areas of research related to the major civilizations of ancient Mexico and Central America. Course offerings will vary in order to focus upon particular themes, subjects, or interpretive problems. *Prerequisite: none; VIS 21 recommended.*

126H. Problems in Ancient Maya Iconography and Inscriptions (4)
This seminar focuses upon the art, architecture, and inscriptions of the ancient Maya. Topics will vary within a range of problems that concern hieroglyphic writing, architecture, and visual symbols the Maya elite used to mediate their social, political, and spiritual worlds. *Prerequisite: none; VIS 21 recommended.*

127A. Curatorial Practices Workshop (2)
Students will be exposed to the professional context of institutional art research, preparation, exhibition, and publication. The content of the course will revolve around the curatorial experience of a particular faculty member. May be repeated once for credit. *Prerequisite: VIS 112 or two upper-division courses in art history.* **Note:** Two two-unit curatorial practices workshop courses count as one course towards the fulfillment of a Group III elective requirement in the major.

128AN-EN. Topics in Art History and Theory
These lecture courses are on topics of special interest to visiting and permanent faculty. Topics vary from term to term and with instructor and many will not be repeated. These courses fulfill upper-division distribution requirements. As the courses under this heading will be offered less frequently than those of the regular curriculum, students are urged to check for availability and descriptions of these supplementary courses in the annual catalogue listings. Like the courses listed under VIS 129, below, the letters following the course number designate the general area in which the courses fall. Students may take courses with the same number but of different content, with consent of instructor and/or program adviser. May be repeated three times for credit. *Prerequisite: none; courses in art history recommended.*

128AN. Topics in Pre-Modern Art History (4)
A lecture course on a topic of special interest in ancient or medieval art. *Prerequisites: upper-division standing; courses in art history recommended.*

128BN. Topics in Early Modern Art History (4)
A lecture course on a topic of special interest in Renaissance or Baroque art. May be repeated three times for credit. *Prerequisites: courses in art history recommended.*

128CN. Topics in Modern Art History (4)
A lecture course on a topic of special interest on Modern or Contemporary art. May be repeated three times for credit. *Prerequisites: courses in art history recommended.*

128DN. Topics in Non-Western Art History (4)
A lecture course on a topic of special interest in Pre-Columbian, Native American, Oceanic, Asian, or African art. May be repeated three times for credit. *Prerequisites: courses in art history recommended.*

128EN. Topics in Art Theory and Criticism (4)
A lecture course on a topic of special interest in art theory, art criticism, or the history of literature on art. May be repeated three times for credit. *Prerequisites: upper-division standing; courses in art history recommended.*

129AN-EN. Special Problems in Art Criticism and Theory (4)
These seminar courses provide the opportunity for in-depth study of a particular work, artist, subject, period, or issue. Courses offered under this heading may reflect the current research interests of the instructor or treat a controversial theme in the field of art history

and criticism. Active student research and classroom participation are expected. Enrollment is limited and preference will be given to majors. The letters following 129 in the course number designate the particular area of art history or theory concerned. Students may take courses with the same number but of different content more than once for credit, with consent of the instructor and/or the program adviser. May be repeated three times for credit. *Prerequisite: VIS 112 or two upper-division courses in art history.*

129AN. Special Problems in Pre-Modern Art History (4)
A seminar on an advanced topic of special interest in ancient or medieval art.

129BN. Special Problems in Early Modern Art History (4)
A seminar on an advanced topic of special interest in Renaissance or Baroque art.

129CN. Special Problems in Modern Art History (4)
A seminar on an advanced topic of special interest in Modern or Contemporary art.

129DN. Special Problems in Non-Western Art History (4)
A seminar on an advanced topic of special interest in Pre-Columbian, native American, oceanic, Asian, or African art.

129EN. Special Problems in Art Theory and Criticism (4)
A seminar on an advanced topic of special interest in art theory, art criticism, or the history of literature on art.

129G. Art History Honors Seminar (4)
This research seminar, centered on a series of critical, thematic, theoretical, and/or historical issues that cut across subdisciplinary specializations, provides outstanding advanced students with the opportunity to undertake graduate-level research. The first part of a two-part sequence completed by Art History Honors Directed Group Study (VIS 129H). Prerequisite: consent of instructor or art history faculty adviser, department stamp required. Note: The Art History Honors Seminar and the attached Art History Honors Directed Group Study counts as one course towards the fulfillment of the Group III requirement.

129H. Art History Honors Directed Group Study (4)
The second part of the honors program sequence, this course provides a forum for students engaged in research and writing to develop their ideas with the help of a faculty adviser and in conjunction with similarly engaged students. *Prerequisite: consent of instructor or art history faculty adviser, department stamp required.*

130. Special Projects in Visual Arts (4)
Specific content will vary each quarter. Areas will cover expertise of visiting faculty. May be repeated twice for credit. *Prerequisite: consent of instructor, department stamp required.*

131. Special Projects in Media (4)
Specific content will vary each quarter. Areas will cover expertise of visiting faculty. May be repeated twice for credit. Two production course limitation. *Prerequisites: VIS 104CN, 105C, 106C, 107CN, or 147B for studio majors, or VIS 180A and VIS 180B for media majors. Open to studio, media, and ICAM majors; ICAM minors only.*

132. Installation Production and Studio (4)
Through discussions and readings, the class will examine the issues and aesthetics of installation art-making. Using media familiar to them, students will produce several projects. May be repeated once for credit. Studio and media majors only. *Prerequisites: VIS 104CN, 105C, 106C, 107CN, or 147B for studio majors, or VIS 180A and VIS 180B for media majors. Open to studio, media, and ICAM majors; ICAM minors only.* Two production course limitation.

140. Digital Imaging: Image and Interactivity (4)
(Cross-listed with ICAM 101.) Introduction to digital image involving images, texts, and interactive display and operates both within computer-mediated space (i.e., Web site) and in physical space (i.e., artist book). Interactive narrative and computer programming are explored. Materials fee required. *Prerequisite: VIS 40 or ICAM 40. Open to media, ICAM, and studio majors; computing and ICAM minors only.* Two production course limitation.

141A. Computer Programming for the Arts I (4)
Computer programming as a tool and conceptual framework for art-making. Course will use Silicon Graphics workstations to teach fundamental aspects of using C programming language and UNIX operating system to create computer graphics, audio, and text-based works. Materials fee required. *Prerequisites: VIS 40 or ICAM 40; and VIS 140 or ICAM 101. Open to ICAM majors and minors only.* Two production course limitation.

141B. Computer Programming for the Arts II (4)
Continuation of VIS 141A. Students extend their programming capabilities to include image processing, multimedia, and interactive 3-D graphics programming contextualized by a further exploration of topics in algorithmic and procedural modeling. Materials fee required. *Prerequisite: VIS 141A. Open to ICAM majors and minors only.* Two production course limitation.

145A. Digital Media I: Time, Movement, Sound (4)
(Cross-listed with ICAM 102.) Exploration of time-dependent media components. Creation and manipulation of digital sound as well as moving images and their integration in multimedia work. Use of computer programming to control time is emphasized. Materials fee required. *Prerequisites: VIS 40 or ICAM 40 and VIS 140 or ICAM 101. Open to media and ICAM majors; ICAM minors only.* Two production course limitation.

145B. Digital Media II (4)
Second course in the sequence where students will implement projects under direction of faculty. Projects involve interactive narrative media, Internet-based publishing (Web site), distributable media (CD-ROM), and/or computer-based interactive environment (virtual reality). Materials fee required. *Prerequisite: VIS 145A or ICAM 102. Open to media and ICAM majors; ICAM minors only.* Two production course limitation.

147A. Electronic Technologies for Art I (4)
Develop artworks and installations that utilize digital electronics. Techniques in digital electronic construction and computer interfacing for interactive control of sound, lighting, and electromechanics. Construction of devices which responsively adapt artworks to conditions involving viewer participation, space activation, machine intelligence. Purchase of components kit required. *Prerequisite: VIS 1. Open to media, studio, and ICAM majors; ICAM minors only.* Two production course limitation.

147B. Electronic Technologies for Art II (4)
Continuation of the electronics curriculum. Design of programmable microcontroller systems for creating artworks that are able to respond to complex sets of input conditions, perform algorithmic and procedural processing, and generate real time output. Purchase of components kit required. *Prerequisite: VIS 147A. Open to media and ICAM majors; computing and ICAM minors only.* Two production course limitation.

149. Seminar in Contemporary Computer Topics (4)
(Cross-listed with ICAM 130.) Topics relevant to computer-based art- and music-making, such as computer methods for making art/music, design of interactive systems, spatialization of visual/musical elements, critical studies. Topics will vary. May be repeated twice. Materials fee required. *Prerequisite: VIS 140 or ICAM 101, VIS 145A or ICAM 102, and MUS 170 or ICAM 103 recommended. Open to media and ICAM majors; ICAM minors only.* Two production course limitation.

151. History of the Experimental Film (4)
An inquiry into a specialized alternative history of film, consisting of experimental works made outside the conventions of the movie industry and which in their style and nature are closer to modernist painting, poetry, etc., than to the mainstream theatrical cinema. Works by such film artists as Man Ray, Salvador Dali, Maya Deren, Stan Brakhage, and Michael Snow will be examined in depth. Materials fee required. *Prerequisite: VIS 84 or consent of instructor.*

152. Film in Social Context (4)
This collection of courses gathers, under one cover, films that are strongly marked by period, geography, and the culture within which they received their dominating local quality. These courses pay particular attention to the stamp of place—climate, dress, habitation, language, music, politics—as well as the filmic moves that helped color such works as environmental. The series takes in the following subjects: Third World films, the Munich films (the new wave of Germans who made their first features in Munich following 1967), Japanese movies, films of the American thirties and their relationship to current thought, American Westerns, Ethnographic Film, Brazil's Cinema Novo, etc. Specific topics to be covered will vary with the instructor. May be repeated twice for credit. Materials fee required. *Prerequisite: VIS 84 or consent of instructor.*

153. The Genre Series (4)
A group of related courses exploring the conventions within such generic and mythic forms as the cowboy, shamus, chorus girls, and vampire films. May be repeated twice for credit. Materials fee required. *Prerequisite: none; VIS 84 recommended.*

154. Hard Look at the Movies (4)
Examines a choice of films, selected along different lines of analysis, coherent within the particular premise of the course. Films are selected from different periods and genres among Hollywood, European, and Third World films. May be repeated once for credit. Materials fee required. *Prerequisite: VIS 84 or consent of instructor.*

155. The Director Series (4)
A course that describes the experiences, looks, and structure of director-dominated films. A different director will be studied each quarter. The student will be required to attend the lecture in the course and to meet with the instructor at least once each week. May be repeated three times for credit. Materials fee required. *Prerequisite: VIS 84 or consent of instructor.*

156N. Special Problems in Film History and Theory (4)
Seminar on an advanced topic in the history and theory of film. Content will vary from quarter to quarter. *Prerequisite: VIS 84 or consent of instructor.* **Note:** Materials fee required.

157. Video History and Criticism (4)
A lecture course that examines video as an art form, its relationship to the development from television and other art forms, and surveys current work in the medium. Materials fee required. *Prerequisites: VIS 22, 84, and 111.*

158. Histories of Photography (4)
Photography is so ubiquitous a part of our culture that it seems to defy any simple historical definition. Accordingly, this course presents a doubled account of the medium; it explores both the historical and cultural specificity of a singular photography as well as some of the multitude of photographies that inhabit our world. Will examine a number of the most important photographic themes from the past 200 years. *Prerequisite: none.*

159. History of Art and Technology (4)
(Cross-listed with ICAM 150.) Aims to provide historical context for computer arts by examining the interaction between the arts, media technologies, and sciences in different historical periods. Topics vary (e.g., Renaissance perspective, futurism and technology, and computer art of the 1950s and 1960s). *Prerequisite: none.* **Note**: Materials fee required.

164. Photographic Strategies (4)
Introduction to the aesthetic problems in photography. Portfolio required for admission. Materials fee required. Two production course limitation. *Prerequisites: VIS 60 and consent of instructor, department stamp required. Open to media majors and photography minors only.*

165. Camera Techniques (4)
An intermediate course on refined control over different films, developers, papers, and other photographic techniques. Portfolio required for admission. Materials fee required. Two production course limitation. *Prerequisites: VIS 60 and consent of instructor. Open to media majors and photography minors only.*

166. Advanced Camera Techniques (4)
Advanced-level course involving new techniques and processes as well as refined control over different films, developers, papers, and other photographic materials. Portfolio required for admission. Materials fee required (photo lab). Two production course limitation. *Prerequisites: VIS 164, 165, and consent of instructor. Open to media majors and photography minors only.*

172. Studio Video (4)
A production course of video as a creative medium and the video studio as a production and post-production tool. Covers lighting, studio sound, the switcher and special effects, directing and editing in the controlled environment of the video studio. *Prerequisites: VIS 111 and 174. Open to media majors only.* Two production course limitation.

174. Media Sketchbook (4)
Video medium used both as production technology and as device to explore the fundamental character of film-making and time-based computer art practices. Students perform all aspects of production with attention to developing ideas and building analytical/critical skills. *Prerequisite: VIS 70N. Open to media and ICAM majors only.* Two course limitation.

175. Introduction to Digital Media Editing (Visual and Sound) (4)
Technical as well as a creative context for understanding the principles of editing and the manipulation of media files in nonlinear editing softwares, focusing on organizational strategies for image and sound and for projects of various lengths. *Prerequisites: VIS 40/ICAM 40, 60, 70N and 174, plus one from VIS 1, 2, 3, 22 or 84. Open to media majors only.* Two production course limitation.

176. Introduction to Filmmaking (4)
Technical foundation, creative, theoretical context to 16mm film production. Motion picture camera (Bell & Howell, Bolex, Arriflex S), lightmeter, frame composition, sound recording, picture and sound editing. Filmmaking process of shooting, lighting, to editing, mixing. Produce short film (1–2 minutes) with post-synchronized soundtrack. *Prerequisites: VIS 174; VIS 60 and 177 recommended. Open to media majors only.* Two production course limitation.

177. Scripting and Editing Strategies (4)
Conceptual structures of scripting and editing. Script writing on reading and analysis of traditional and experimental works. Students write several short scripts. Editing as structural partner to scripting, studying strategies and grammars shaping film on videotape. Analytical papers produced. *Prerequisites: VIS 70N and VIS 174. Open to media majors only.* Two production course limitation.

180A. Documentary Evidence and the Construction of Authenticity in Current Media Practices (4)
Exploration of concepts in representational artworks by critically examining "found" vs. "made" recorded material. Advanced film/video, photography, computing work. Issues of narrative and structure; attention to formal aspects of media work emphasized. Cannot be taken same quarter as VIS 180B. *Prerequisites: VIS 111, 174 and one from VIS 140/ICAM 101, 145A/ICAM 102, 145B, 164, 165, 172, 176, 177; VIS 177 strongly recommended. Open to media majors only.* Two production course limitation.

180B. Fiction and Allegory in Current Media Practices (4)
Exploration of choices in invention, emphasizing "made" over "found." Advanced film/video, photography, and computing. Issues of narrative and structure, and formal aspects of media work emphasized. Cannot be taken same quarter as VIS 180A. *Prerequisites: VIS 111, 174 and one from VIS 140/ICAM101, 145A/ICAM 102, 145B, 164, 165, 172, 176, 177; VIS 177 strongly recommended. Open to media majors only.* Two production course limitation.

181. Sound and Lighting (4)
Advanced course to gain sophisticated control of lighting and sound recording techniques with understanding of theoretical implications and interrelation between production values and subject matter. Interactions between sound and image in various works in film, video, or installation. *Prerequisite: VIS 174, and three of the following courses depending on emphasis: VIS 164, 165, 172, 175, 176, 177. Open to media majors only.* Two production course limitation.

182. Advanced Editing (4)
Film/video editing and problems of editing from theoretical and practical points-of-view. Films and tapes analyzed on a frame-by-frame, shot-by-shot basis. Edit stock material and generate own materials for editing final project. Aesthetic and technical similarities/differences of film/video. Repeated twice for credit. *Prerequisites: two required from VIS 164, 165, 172, 176, 177; VIS 177 strongly recommended. Open to media majors only.* Two production course limitation.

186. Advanced Filmmaking Strategies (4)
Presents techniques of sync sound recording, shooting, crew work, planning pre-production and production; links technical decisions with creative and theoretical understanding of film production. Prepare, produce, edit short 16mm film (3–5 minutes). Recommend fully developed script to enroll. Repeated once for credit. *Prerequisites: VIS 176, 177, and consent of instructor. Open to media majors only.* Two production course limitation.

194. Fantasy in Film (4)
This course will explore the path of the deliberately "unreal" in movies. Fantasy in Film will be considered both in terms of its psychological manifestations and also in terms of imaginary worlds created in such willfully anti-realistic genres as science-fiction, horror, and musical films. *Prerequisite: none.* Offered in summer session only.

197. Media Honors Thesis (4)
This advanced-level sequence coordinates three consecutive independent research courses to culminate in a completed thesis project in the third quarter of study. After the project's public presentation, the faculty involved in the project will determine whether the student will graduate with departmental honors. *Prerequisite: consent of instructor.* **Note**: Requires a written proposal, 3.5 GPA in the major, prior consent from all involved and approvals by the department chair and provost.

198. Directed Group Study (2-4)
Directed group study on a topic or in a group field not included in regular department curriculum, by special arrangement with a faculty member. *Prerequisite: consent of instructor.* **Note**: Open only to upper-division students. Requires instructor's, department chair's, and provost's approval. Pass/Not Pass grades only.

199. Special Studies in the Visual Arts (4)
Independent reading, research, or creative work under direction of a faculty member. *Prerequisite: consent of instructor.* **Note**: Open only to upper-division students. Requires instructor's, department chair's, and provost's approval. Pass/Not Pass grades only.

ICAM 103. Musical Acoustics (4)
(Cross-listed with MUS 170.) An introduction to the acoustics of music with particular emphasis on contemporary digital techniques for understanding and manipulating sound. *Prerequisites: MUS 1A, 2A, or 4*

ICAM 110. Computing in the Arts: Current Practice (4)
Designed around the presentations by visiting artists, critics, and scientists involved with contemporary issues related to computer arts. Lectures by the instructor and contextual readings provide background material for the visitor presentations. *Prerequisite: none.* **Note**: Materials fee required.

ICAM 120. Virtual Environments (4)
Students create virtual reality artworks. Projects may be done individually or in groups. Exploration of theoretical issues involved will underlie acquisition of techniques utilized in the construction of virtual realities. Materials fee required. *Prerequisites: VIS 145A or ICAM 102; CSE 11 recommended. Open to ICAM majors and minors only.* Two production course limitation.

ICAM 160A. Senior Project in Computer Arts I (4)
Students pursue projects of their own design over two quarters with support from faculty in a seminar environment. Project proposals are developed, informed

by project development guidelines from real-world examples. Collaborations are possible. Portfolio required for admission. *Prerequisites: VIS 141B or VIS 145B or VIS 147B or MUS 172. Open to ICAM majors only. Department stamp required.*

ICAM 160B. Senior Project in Computer Arts II (4)
Continuation of ICAM 160A. Completion and presentation of independent projects along with documentation. *Prerequisites: ICAM 160A. Open to ICAM majors only. Department stamp required.*

ICAM 198. Directed Group Study (2-4)
Directed group study on a topic or in a group field not included in regular department curriculum by special arrangement with a faculty member. May be repeated twice for credit. *Prerequisites: consent of instructor.* **Note**: Only open to upper-division students. Requires instructor approval. Pass/Not Pass grades only.

ICAM 199. Special Studies (2/4)
Independent reading, research or creative work under direction of faculty member. *Prerequisites: department stamp and upper-division standing required.*

GRADUATE

CORE SEMINARS

200. Introduction to Graduate Studies in the Visual Arts (4)
Introduces incoming students to the work of art history, studio, and media faculty as it engages key common and comparative themes. Required of all first-year students in both the Ph.D. and M.F.A. programs. (Required, M.F.A., Ph.D.)

201. Contemporary Critical Issues (4)
An exploration of a range of issues important on the contemporary critical scene through readings and writing assignments. Topics will vary from year to year. Offered every fall. (Required, M.F.A.)

202. Art Practice (4)
A workshop/seminar devoted to a particular materials practice (e.g., media, painting, digital media, etc.) that engages with critical questions arising within that discipline. Content will vary from quarter to quarter. May be repeated once for credit. (Required, M.F.A.)

203. Working Critique (4)
Workshop in which students engage in an extensive evaluation of each others' ongoing work in preparation for either the First Year Review or MFA Review. Offered every winter. May be repeated once for credit. (Required, M.F.A.)

204. Re-Thinking Art History (4)
Critical evaluation of the methods, practices, and disciplinary commitments of art history, encompassing both revisionist interventions of the late twentieth century and earlier paradigms, in order to envision new discipline-specific and interdisciplinary directions for the future of art history and visual culture. (Required, Ph.D.)

205. Introduction to Graduate Studies in Art Practice (4)
This seminar introduces art practice students to the graduate program in a workshop environment. Emphasis is on the production of new work and on situating that work in relation to a larger art context. (Required, M.F.A.)

ART PRACTICE/THEORY

210. Narrative (4)
Examination of narrative issues in contemporary art-making. Traditional and experimental narrative practices in painting, drawing, sculpture, and performance are explored alongside narrative strategies in media and digital media.

211. Fact and Fiction (4)
This seminar addresses the space between narrative work generated from a factual base and that generated from a fictional one. Special attention will be given to discussing work that confounds the assumed gap between the two.

212. History and Memory (4)
This seminar will engage the space between personal and larger histories. How is one's own past both intertwined with and determined by larger social histories?

213. Public Space (4)
An exploration of what public space is and how it operates, with a view toward an expanded context for considering how public artwork can operate within it. Included are areas such as mass media, activism, community action, computer networks, ecology, and alternative forums.

215. Human Interface (4)
Examines human interface as it informs or transforms how we read and participate in culture at large. Concepts such as subject/author/object relationships, abstraction, metaphor, analogy, visualization, and complexity are discussed to establish context.

216. The Object (4)
An investigation of the world of artifacts ("works of art" and others) and how they function as agents of communication and modifiers of consciousness. Contemporary perspectives drawn from the fields of art theory, anthropology, contemporary art, and semiotics will be utilized.

217. Communities and Subcultures (4)
A critical examination of the practices of self-defined communities (e.g., Bauhaus, Shaker, Surrealists) which have attempted to change the social and spiritual quality of life by aesthetic means and of communities and subcultures defined by other means.

218N. Imaging Selves and Others (4)
Explores various strategies exhibited in a wide range of contemporary art practices engaging in the representation of personality, spirituality, and the physical self.

219. Special Topics in Art Practice/Theory (4)
Examines a topic of special interest to permanent and visiting faculty that is not addressed in the regular curriculum. As in other Art Practice/Theory seminars, students will both produce work and read and write critically about the topic. Topics will vary.

HISTORY/THEORY/CRITICISM

Categories/Constructs

230. "Art" as Category (4)
Explores the complex and changing criteria by which certain (categories of) objects and practices are designated as "art" in culturally and historically diverse societies.

231N. Confronting the Object (4)
Investigates the nature and status of art objects and practices and the forms of engagement with them through topics such as the practice and metaphysics of description; phenomenological analysis; film analysis; and ekphrasis and visual analysis.

232. Artistic Identities (4)
Explores the historical, theoretical, and cross-cultural concepts of the artist/auteur and his/her varied and shifting identities as inscribed in works of art, recorded in biography and critical literature, and enacted through social roles.

233N. Frames of Production (4)
Critical and historical analysis of the institutions, social networks, and communicative media that enable the production of art, including particular institutions (art academies, workshops and studios, including film studios), artists' communities, ritual frameworks, state and private patronage, etc.

234N. Frames of View (4)
Critical and historical analysis of the institutions, social networks, and communicative media through which art is presented to its audiences. May also address theories of vision and visuality, spectatorship, public space, originality and reproduction, and public space.

235N. Frames of Analysis (4)
Historical critique and philosophical analysis of the central terminology and constructs of art history, theory, and criticism. May address such key terms as style, genre, and periodization or a topic such as theories of representation and narrative.

Theories/New Visions

240. Histories of Theory and Criticism: Plato to Post-Modernism (4)
Historical and cross-cultural investigations of art theory and criticism, antiquity to the present. May be taught as an historical overview or focus on a particular topic, e.g., Critical Currents Since World War II, Renaissance Foundations, From Culture to Popular Culture.

241. Topics in Contemporary Critical Theory (4)
Focused studies, changing from year to year, in contemporary theoretical positions and perspectives (e.g., New Social Theory, Post-Colonialism, Gender Theory) and one or more leading theorists (e.g., Deleuze, C. S. Peirce, Steinberg).

242. Theories of Media and New Media (4)
Critical study of the ways in which media (film, video, photography) and new media have been theorized. May be taught from an historical or comparative perspective or focus on a single topic or theorist.

243. Aesthetic Theory (4)
Study of the philosophical concepts of the function of art and visual culture and the criteria for its evaluation in diverse epochs and cultures. May be taught as an historical overview or comparative study or focus a single topic or theorist.

244. Studies in the Relationship of Theory and Practice (4)
Investigations of one or more artist-theorists or movements, contemporary or historical, that put in issue the interface between theory and practice. May also focus on a topic such as perspective, color, or narrative, or genre such as film or new media.

Times/Terrains

250N. Seminar in Ancient Art (4)
The arts of Greece, Rome, and allied cultures in the ancient world. Topics will vary, e.g., Roman Portraiture: Self and Social Mask; The Invention of Perspective and Revolution in Two-Dimensional Representation; The "Modern" Art of Antiquity (late third to early fourth century A.D.).

251. Seminar in Medieval Art (4)
European art from late antiquity through the fourteenth century and the historical processes by which "medieval" art has been constructed as a category. Topics may include Devotional Vision and the Sacred Image; Medieval Comic Genres; Neo-Medievalisms, Fifteenth Century to Today.

252. Seminar in Renaissance Art (4)
Concentrates on the art of the Renaissance in Italy and the North through a changing series of topics, e.g., Vision and Composition in Perspective; The Sistine Chapel; Envisioning Jan Van Eyck; Renaissance Print-Making; Leonardo da Vinci's *La Gioconda*.

253. Seminar in Early Modern Art (4)
European and American art, 1580s to 1850. Topics might include Deconstructing the Enlightenment: Images of Disorder; Escaping History: Genre Painting, Rococo to Impressionism; Politics and Love in the Art of Jacques-Louis David; Art and Urbanism in Baroque Rome.

254. Seminar in Modern Art (4)
European and American art, ca. 1850 to 1960. Questions in Impressionism and Post-Impressionism; The Cubist Revolution: Marcel Duchamp and the Anti-Formalist Tradition; American Modernism; Reckoning with Abstract Art; Issues in Dada and Surrealism; Soviet Avant-Gardes.

255. Seminar in Contemporary Art (4)
Thematic and critical discussions of recent U.S. and international art, 1960s to the present. Art/Text; Mixed Media Practices; Conceptual Art; Art After Appropriation; Global Art at the Millennium; New Genres of Public Art; Mike Kelly and the Conceptual Vernacular: Art and Activism.

256. Seminar in Media and New Media (4)
Topics in media (photography, film, video) and new media, contemporary or historical. Coverage may be broad or addressed to a particular topic such as Film Remakes; Silent Cinema; Photography and American Social Movements; The Language of New Media.

257. Seminar in Meso-American Art (4)
Topics relating to the art and civilizations of Precolumbian Mexico and Central America, either specifically art historical (such as iconographic, formal, and stylistic analysis) or encompassing a spectrum of interdisciplinary and cultural/historical problems.

258. Seminar in Chinese Art (4)
Advanced studies in the secular and religious art traditions of China. From year to year, the seminar may focus on early China (Neolithic to the end of the T'ang dynasty), on later dynasties (Sung, Yuan, Ming) or on art of the People's Republic.

259. Seminar in Latin American Art (4)
Historical and theoretical problems in the art of Mexico, Central, and South America art from the colonial period to today, as well as from the Hispanic traditions of the American Southwest.

269. Contextual Studies: Special Topics (4)
Studies in the art of cultures and time periods not covered in the currently published curriculum (e.g., African Art, Japanese Art, Byzantine Art, Islamic Art) or of issues and genres crossing epochal, cultural, and media boundaries.

OTHER

280. Workshop in Critical Writing (4)
Practice in writing about art (both one's own and others) accompanied by analysis of selected contemporary critical writings.

281. Curatorial Practice (4)
Methodological investigation of and training in the practices of art museums, galleries, film and digital environments, public arts organizations, and the like. Instruction by museum and gallery curators and opportunities for participation in ongoing programs at local art institutions.

282. Special Projects in Art Practice (4)
Advanced workshop in specialized areas of art practice (e.g., Sound and Lighting, Editing).

295. Individual Studies for Graduate Students (1-12)
Individual research with the student's individual faculty adviser in preparation for their comprehensive exhibitions for the M.F.A. degree or qualifying exam for the Ph.D. These units are intended to be with the chair of the student's review committee. For the M.F.A. degree, these units can only be taken after completing the First Year Review. (Required, M.F.A., Ph.D.)

298. Directed Group Study (1-12)
Directed group study on specific topics not covered at present in the normal curriculum. Used as an experimental testing of courses that may be given regular course numbers if proved successful. Special arrangement with faculty member. *Prerequisite: consent of department.*

299. Graduate Research (1-4)
Graduate-level research under the direct guidance of a faculty member. *Prerequisite: consent of instructor.*

500. Apprentice Teaching (1-4)
Apprentice teaching in undergraduate courses given by the Department of Visual Arts. Graduate students are required to teach a minimum of one quarter (four units) within the department to fulfill degree requirements.

501. Apprentice Teaching in Culture, Art, and Technology (CAT) (4)
Consideration and development of pedagogical methods appropriate to undergraduate teaching in the interdisciplinary Sixth College Core Sequence, Culture, Art and Technology. Supervised by the Core Program faculty, director and associate directors for the Writing and Thematic Programs. *Prerequisites: graduate student and consent of instructor.*

Warren College

OFFICE: Literature Building, Second Floor
Warren College
http://warren.ucsd.edu/

The Writing Program

OFFICE: Building 410, University Center

Each student must complete a two-course sequence in Warren Writing (10A and 10B) within four quarters (following successful completion of the Subject A requirement). **Note:** Effective fall quarter 2000, all new and continuing students are required to complete Warren writing courses only at UCSD. The purpose of the sequence is to teach and thereby enable students, through intensive practice, to read critically and write appropriately in a variety of academic contexts. Classes are seminar-size and center on discussion of student work.

The two-quarter sequence emphasizes written argumentation based on primary and secondary sources. The curriculum provides a context within which a diversity of cultural experiences is foregrounded to address a range of issues inherent in the relationship of the "Individual and U.S. Society," the primary theme of the sequence. The readings are accessible, scholarly writings that interrogate aspects of this relationship, and may include novels, short stories, essays, autobiographies, political documents, and book-length nonfictional treatments of the theme. Thus, the writing and readings prepare students for their work in various academic disciplines.

In both 10A and 10B, student writing is duplicated and discussed by the class in a workshop setting. Instructors hold conferences with students individually during the quarter and provide written and oral commentaries on student work. Every student receives a mid-quarter evaluation, and a final narrative evaluation is placed in the student's academic file. The minimum writing requirement is 8,000 words per quarter.

10A. The Writing Course A (4)
A workshop course in reading and writing required of all Warren College students. The course emphasizes argumentation and critical writing based on sources. *Prerequisites: satisfaction of the university Subject A requirement and must be a Warren College student. Letter grade only.*

10B. The Writing Course B (4)
A workshop course in reading and writing required of all Warren College students who have completed 10A. The course continues the emphasis on argumentation and critical writing based on sources. *Prerequisites: completion of WCWP 10A and must be a Warren College student. Letter grade only.*

Warren Honors Program

OFFICE: 3238 Literature Building, Second Floor, Warren College

The Warren Honors Program offers students educational, cultural, and social experiences designed to broaden their intellectual interests. The activities vary each year and are planned to foster student interaction and promote a sense of community.

Students may replace one course in a minor, program of concentration, or area study with a faculty-directed Independent Study (199) honors research paper. If the research paper is written within the student's major, departmental approval may be needed for acceptance toward major requirements. The paper may also be written as part of an Academic Internship (197). The Michael Addison award is presented at the graduation ceremony to the student who is judged to have written the most distinguished research paper in the Honors Program.

Entering freshmen with a high school GPA of 3.8 or above and SAT I scores of 700 verbal/ 700 mathematics, SAT II writing score of 700, are eligible to participate in the Honors Program. Students remain in the program until thirty-six units of UCSD credit are completed. After that, a cumulative GPA of 3.5 on all units completed at UCSD must be maintained to remain in the program.

Students who do not qualify for the Honors Program at the time of admission may join it as soon as a cumulative GPA of 3.5 is attained on thirty-six or more units completed at UCSD. Entering transfer students with a GPA of 3.8 based on at least thirty-six quarter-units of college work are also eligible.

Warren Scholars Seminar

The Warren Scholars Seminar offers an interdisciplinary academic curriculum which is designed to help students broaden their intellectual interests. Students enroll in two seminars, Warren 11A-B, Warren Scholars Seminar, which fulfill the college writing requirement. The seminars are taught by a variety of distinguished faculty and teaching assistants.

Entering freshman Honors Program students are admitted to the Warren Scholars Seminar by invitation.

Students in the Honors Program may be discussion leaders in Warren 11A-B (Warren 195, Apprentice Teaching). Discussion leaders participate in planning meetings, interview the faculty speakers, are trained to lead group discussions, read and evaluate student papers, and plan social events for the class.

Additional information may be obtained by writing to: Warren College Honors Program Coordinator, Warren College, UCSD, La Jolla CA 92093-0422.

11A. Warren Scholars Seminar A (4)
The Warren College Scholars Seminar A allows students to develop and refine their expressive and analytical skills. The seminar offers an interdisciplinary approach to topics on the relation of individuals and society, and the function of evidence and observation in the formation of theories. The course emphasizes argumentation and critical thinking. *Prerequisites: limited to freshman Warren College Honors Program students with math/verbal/writing scores of 700 and above, and upon approval of a submitted writing sample.*

11B. Warren Scholars Seminar B (4)
The Warren Scholars Seminar B allows students to develop and refine their expressive and analytical skills by exploring a topic that offers viewpoints from a wide range of disciplines. The seminar emphasizes argumentation and critical writing. The topic will vary each year. *Prerequisite: Warren 11A or by consent of instructor.*

195. Apprentice Teaching (1)
Undergraduate instructional assistance. Responsible both in area of learning and instruction. Student must prepare reading materials assigned by the professors and lead student discussions in Warren 11A or 11B. *Prerequisite: student must be in the Warren College Honors Program.*

Ethics and Society

OFFICE: 3238 Literature Building, Second Floor, Warren College

Ethics and Society is an interdisciplinary course required of all Warren students. It is cross-listed as Political Science 27 and Philosophy 27 (see departmental listings). A student may enroll in this course through either department, but not both. Ethics and Society is to be taken after the completion of Warren Writing 10A-B (or Scholars Seminar 11A-B), either in the spring of the freshman year or in any quarter of the sophomore year. This requirement is waived for certain upper-division transfer students (see the program of concentration brochure).

Health Care—Social Issues

OFFICE: Interdisciplinary Programs, 3238 Literature Building, Second Floor, Warren College

Health Care–Social Issues is an interdisciplinary minor administered by Warren College, available to all UCSD students with a general interest in health care issues and to students considering a health care career. For more information, see listing under "Health Care–Social Issues."

Law and Society

OFFICE: Interdisciplinary Programs, 3238 Literature Building, Second Floor, Warren College

Law and Society is an interdisciplinary minor administered by Warren College, available to all UCSD students with a general interest in law as a social institution and to students considering law-related careers. For more information, see listing under "Law and Society."

Academic Internship

OFFICE: Literature Building, Second Floor, Warren College

The Academic Internship Program is developed and administered by Warren College, and it is available to juniors and seniors with a 2.5 GPA (some internships require a 3.0 GPA) in any college at UCSD. For more information, see listing under "Academic Internship."

One-unit Undergraduate Seminar

The One-Unit Undergraduate Seminar Program is a campuswide program administered by Warren College. The purpose is to (a) foster closer interaction between undergraduate students and faculty members; and (b) introduce undergraduates to exciting areas of intellectual interest. Generally, the seminars are accessible to students at all levels with no prerequisites. Enrollments are limited to twenty-five students per seminar. Grading is P/NP only, and each student is limited to four seminars for credit.

Appendix

Nondiscrimination and Affirmative Action Policy Statement for University of California

It is the policy of the university not to engage in discrimination against or harassment of any person employed by or seeking employment with the University of California on the basis of race, color, national origin, religion, sex, gender identity, pregnancy (includes pregnancy, childbirth, and medical conditions related to pregnancy or childbirth), physical or mental disability, medical condition (cancer-related or genetic characteristics), ancestry, marital status, age, sexual orientation, citizenship, or status as a covered veteran (special disabled veteran, Vietnam era veteran, recently separated veteran, or any other veteran who served on active duty during a war or in a campaign or expedition for which a campaign badge has been authorized). This policy applies to admissions, access, and all employment practices, including recruitment, selection, promotion, transfer, merit increase, salary, training and development, demotion, and separation. This policy is intended to be consistent with the provisions of applicable state and federal laws and university policies.

In addition, it is the policy of the university to undertake affirmative action, consistent with its obligations as a federal contractor, for people of color and women, for persons with disabilities, and for covered veterans. The university commits itself to apply every good faith effort to achieve prompt and full utilization of people of color and women in all segments of its workforce where deficiencies exist. These efforts conform to all current legal and regulatory requirements, and are consistent with university standards of quality and excellence.

Inquiries regarding the University of California, San Diego's (UCSD) equal employment opportunity policies and student-related nondiscrimination policies may be directed to:

Student Affairs—
Joseph W. Watson
Vice Chancellor—Student Affairs
Bldg. 112 University Center,
UCSD
9500 Gilman Drive, Dept. 0015
La Jolla, CA 92093-0015
(858) 534-4370

Academic Affairs—
David R. Miller
Acting Senior Vice Chancellor—
Academic Affairs
Bldg. 105 University Center,
UCSD
9500 Gilman Drive, Dept. 0001
La Jolla, CA 92093-0001
(858) 534-3130

Staff and Management—
Steve W. Relyea
Vice Chancellor Business Affairs
Sec. 504 Coordinator—Staff
Bldg. 110 University Center, UCSD
9500 Gilman Drive, Dept. 0007
La Jolla, CA 92093-0007
(858) 534-3390

UCSD recognizes its obligation to provide program accessibility (as described in Section 504 of the 1973 Rehabilitation Act and the Americans with Disabilities Act of 1990) for persons with disabilities. For information as to the existence and location of services, activities, and facilities that are accessible to and usable by persons with disabilities, contact:

Joseph W. Watson
Vice Chancellor Student Affairs
Sec. 504 Coordinator—Students
Bldg. 112 University Center, UCSD
9500 Gilman Drive, Dept. 0015
La Jolla, CA 92093-0015
(858) 534-4370

David R. Miller
Acting Senior Vice Chancellor Academic Affairs
Sec. 504 Coordinator—Faculty
Bldg. 105 University Center, UCSD
9500 Gilman Drive, Dept. 0001
La Jolla, CA 92093-0001
(858) 534-3130

Barry J. Niman
ADA Coordinator
Manager, Employee Rehabilitation Program
Torrey Pines Center South, Suite 348
9500 Gilman Drive, Dept. 0944
La Jolla, CA 92093-0944
(858) 534-6743
(858) 534-3059

Steve W. Relyea
Vice Chancellor Business Affairs
Sec. 504 Coordinator—Staff
Bldg. 110 University Center, UCSD
9500 Gilman Drive, Dept. 0007
La Jolla, CA 92093-0007
(858) 534-3390

UCSD Policies and Procedures Applying to Student Activities

Students enrolling at UCSD are required to observe campus regulations, including but not limited to the Standards of Conduct and the Policies and Procedures Applying to Student Activities, which are available to students at http://ugr8.ucsd.edu/judicial/ as well as the following locations:

Student Legal Services
Student Organizations and Leadership Opportunities
College Dean Offices
Office of Graduate Studies and Research
Office of the Student Affairs Dean, School of Medicine
Student Policies and Judicial Affairs
SIO, Graduate Student Department

Notice to Students of Their Privacy Rights

In accordance with the Federal Family Educational Rights and Privacy Act of 1974 and campus procedures implementing the University of California Policies Applying to the Disclosure of Information from Student Records, students at the San Diego campus of the university have the right:

1. To inspect and review records pertaining to themselves in their capacity as students;

2. To have withheld from disclosure, absent their prior consent for release, personally identifiable information from their student records, with exceptions as noted in Section 160.2 of the university's policies (see also Directory or Public Information below);
3. To inspect records maintained by the campus of disclosure of personally identifiable information from their student records;
4. To seek correction of their student records through a request to amend the records or a request for a hearing; and
5. To file complaints with the Department of Education regarding alleged violations of the rights accorded them by the Federal Act.

Directory or Public Information

The Federal Family Educational Rights and Privacy Act of 1974 (revised June 1976) permits the university to release or publish, without the student's consent, items in the category of "public information" which are name, address (campus and/or permanent), telephone number, campus email address, date and place of birth, major fields of study, dates of attendance, degrees and honors received, the most recent previous educational institutions attended, participation in officially recognized activities, including intercollegiate athletics, and the name, weight and height of participants on intercollegiate university athletic teams. Students may request in writing, by the last day of registration each quarter, that any or all personally identifiable information from their records not be regarded as public information. Forms for this purpose are available in the Registrar's Office.

Notification of Rights Under FERPA for Postsecondary Institutions

The Family Educational Rights and Privacy Act (FERPA) affords students certain rights with respect to their education records. They are:

1. The right to inspect and review the student's education records within forty-five days of the day UCSD receives a request for access.

   Student should submit to the registrar, dean, head of the department written requests that identify the record(s) student wishes to inspect. The UCSD official to whom the request was submitted will make arrangements for access and notify the student of the time and place where the records may be inspected. If the records were not maintained by the UCSD official to whom the request was submitted, that official shall advise the student of the correct official to whom the request should be addressed.
2. The right to request amendments of the student's education records that the student believes are inaccurate or misleading.

   Students may ask UCSD officials to amend a record that they believe is inaccurate or misleading. They should write the UCSD official responsible for the record, clearly identify the part of the record they want changed, and specify why it is inaccurate or misleading. If the UCSD official decides not to amend the record as requested by the student, that official will notify the student of the decision and advise the student of the procedures to appeal the denial.
3. The right to consent to disclosures of personally identifiable information contained in the student's education records, except to the extent that FERPA authorizes disclosure without consent.

   One exception which permits disclosure without consent is disclosures to UCSD or UC officials with legitimate educational interests. A UCSD or UC official is a person employed by UCSD or UC in an administrative, supervisory, academic, research, or support staff position: a person or company with whom UCSD or UC has contracted (such as attorney, auditor, or collection agent): or a student serving on an official committee, such as a disciplinary or grievance committee. A UCSD or UC official has a legitimate educational interest if the official needs to review an education record in order to fulfill his or her professional responsibility.
4. The right to file a complaint with the U.S. Department of Education concerning alleged failures by UCSD to comply with the requirements of FERPA.

   The name and address of the office that administers FERPA is:

   Family Policy Compliance Office
   U.S. Department of Education
   400 Maryland Avenue, SW
   Washington, DC, 20202-4605

Questions about these rights or any other aspect of student records management by UCSD officials may be referred to the Director, Student Policies and Judicial Affairs, Student Center, Building B, or by telephone at (858) 534-6225 or email at naguilar@ucsd.edu. The text of FERPA may be found in the Government Documents section of the UCSD Geisel Library. Copies of the UCSD student records policy, PPM 160-2, may be accessed electronically at http://adminrecords.ucsd.edu/ppm/docs/160-2.html.

UCSD Sexual Harassment Prevention and Policy

The University of California, San Diego is committed to creating and maintaining a community in which all persons who participate in UCSD programs and activities can work together in an atmosphere free from all forms of harassment, exploitation, or intimidation. Every member of the UCSD community should be aware that UCSD is strongly opposed to sexual harassment and that such behavior is prohibited both by law and UCSD policy. Retaliation against a person who brings a complaint of sexual harassment is also strictly prohibited and may result in separate disciplinary action. It is UCSD's intention to take whatever action may be needed to prevent, correct, and if necessary, discipline behavior which violates this policy.

Laws and University Policies Prohibiting Sexual Harassment

The California Fair Employment and Housing Act and Title VII of the Federal Civil Rights Act of 1964, as amended, prohibit sexual harassment in employment. Title IX of the Education Amendments of 1972 prohibits sexual harassment in educational institutions which are recipients of federal funds. UCSD's policy prohibits discrimination on the basis of sex, including sexual harassment, and provides for disciplinary action for inappropriate conduct.

Defining Sexual Harassment

Sexual harassment is defined as unwelcome sexual advances, requests for sexual favors, and other verbal or physical conduct of a sexual nature when any or all of the following conditions result:

- Submission to such conduct is made either explicitly or implicitly a term or condition of instruction, employment, or participation in any university activity.
- Submission to or rejection of such conduct by an individual is used as a basis for evaluation in making academic or personnel decisions affecting an individual.
- Such conduct has the purpose or effect of unreasonably interfering with an individual's performance or creating an intimidating, hostile, or offensive university environment.

A determination of whether particular conduct constitutes sexual harassment takes into account the totality of the circumstances, including:

1. the frequency of the offensive conduct;
2. its severity;
3. whether it is physically threatening or humiliating;
4. the location of the conduct and the context in which it occurred;
5. the degree to which the conduct affected the education or employment environment; and
6. the relationship between the parties.

Sexual harassment does not typically include verbal expression or written material that is relevant and appropriately related to course subject matter or curriculum.

Sexual harassment may occur between persons of differing power or between peers. In addition, sexual harassment may involve a female harassing a male, or a male or female harassing a person of the same gender.

Consensual Relations

UCSD's consensual relationship policy addresses potential ethical and legal issues that arise when individuals develop romantic or sexual relationships. In addition, the UC regents have approved a systemwide faculty-student relationship policy that prohibits a faculty member from becoming romantically or sexually involved with students for whom the faculty member has or should expect to have supervisory responsibility.

Prevention and Education

To implement UCSD's policy regarding sexual harassment, the Office of Sexual Harassment Prevention and Policy (OSHPP) provides assistance in investigating and resolving complaints and provides education to the entire UCSD community. Emphasis is on prevention and early resolution. Copies of UCSD's policy and procedures may be obtained at OSHPP at 201 University Center or at its campus Web page at http://oshpp.ucsd.edu. Faculty, staff, and students are encouraged to review the interactive online education program, *Preventing Sexual Harassment*, available on the OSHPP Web page.

Complaint Resolution

UCSD has established formal and informal procedures for resolving sexual harassment complaints. There are several informal resolution options, depending on the circumstances, including educational programs for targeted campus units or for particular individuals and mediation between the parties. Where informal resolution is unsuccessful or inappropriate, a formal complaint may be filed and a formal investigation undertaken. There is no prescribed sequence, so choosing one option first does not prevent a complainant from choosing a different option for resolution later on.

Because complaints are most effectively resolved at the earliest possible stage, UCSD encourages early reporting of concerns or complaints regarding sexual harassment. If you believe you have been sexually harassed, you are encouraged to discuss your options and learn about UCSD procedures by contacting OSHPP at (858) 534-8298. You may obtain advice without filing a complaint. Unreasonable delay in reporting sexual harassment or failure to utilize UCSD's complaint resolution procedures may affect your legal rights.

A number of governmental agencies also accept complaints of sexual harassment, including the California Department of Fair Employment and Housing, the U.S. Equal Employment Opportunity Commission, and the Office for Civil Rights, U.S. Department of Education. The time deadlines for filing such complaints vary between 180 and 365 days.

Retaliation

Threats, other forms of intimidation, and retaliation against a faculty member, student, or staff employee for bringing a complaint of sexual harassment or for assisting another in bringing a complaint are prohibited. Retaliation is itself a violation of UCSD policy and applicable law, and is a serious offense. Complaints of retaliation may be brought through the informal or formal sexual harassment complaint procedures. Acts of retaliation may result in discipline.

Title IX Coordinator

Persons who wish to bring a complaint alleging a violation of Title IX of the Education Amendments of 1972 may contact the Title IX Coordinator as follows:

Lori Chamberlain, Title IX Coordinator
University of California, San Diego
9500 Gilman Drive, Mail Code 0024
La Jolla, California 92093
(858) 534-8298

The Regents of the University of California

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Matthew Murray, Student Regent (June 30, 2004)
Jodi Anderson, Student Regent Designate (June 30, 2005)

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(September 1, 2002 to August 31, 2004)

George Blumenthal
(September 1, 2003 to August 31, 2005)

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Donald F. Tuzin, 2004–05

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Carmen Vazquez, *Student Life*

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Patricia Mahaffey

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Renee Barnett-Terry

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—

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Callaway Golf Chair in Structural Mechanics
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Center for Magnetic Recording Research Chair in Materials
—

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—

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Center for Magnetic Recording Research Chair in Physics
H. Neal Bertram

Chair in High Performance Computing
Francine Berman

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—

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UCSD Facts and Figures (as of fall 2003)

On-campus student enrollment
- Undergraduate....19,872
- Warren....4,559
- Muir....3,866
- Marshall....3,856
- Revelle....3,697
- Roosevelt....3,232
- Sixth....662
- Graduate....3,465
- Medical School (including 540 Medical Center residents and interns)....1,370
- Total students....24,707

Grade-point averages
- Freshman....2.92
- Sophomore....3.00
- Junior....3.04
- Senior....3.05

Number of undergraduates in most populous departments
- Biology....3,055
- Economics....1,724
- Psychology....1,147
- Electrical and Computer Engineering (ECE)....1,136
- Computer Science and Engineering (CSE)....1,077
- Political Science....1,067
- Bioengineering....885
- Communication....797
- Mechanical and Aerospace Engineering..767
- Visual Arts....734

Based upon the previous year's experience, 94 percent of all new freshmen enrolled at UCSD in the fall quarter are also enrolled in the subsequent fall quarter. Eighty-two percent of all students who begin their undergraduate studies as freshmen at UCSD complete their degree requirements here within six years. Questions or requests for more detailed information should be directed to the Office of Student Research and Information.

UCSD Extension enrollment....29,844
Summer Session enrollment....13,794
On campus teaching faculty members....1,727
Books in library collection....2,953,024
Total land area—UCSD
- Main campus....1,202
- Outlying areas....393
- UC Natural Reserves....367
- Total acres....1,962

Members of Honorary Societies/Prizes/Awards
- A.B. Wood Medal and Prize....1
- Academia Sinica....1
- Academic Senate Distinguished Teaching Awards....19
- Academie des Sciences, France....1
- Acoustical Society of America....1
- African Studies Association....1
- American Academy of Arts and Sciences...81
- American Academy of Mechanics....4
- American Academy of Microbiology....2
- American Academy of Pediatrics....1
- American Academy of Religion....1
- American Anthropological Association....6
- American Association for the Advancement of Science....77
- American Association of Anatomists....1
- American Astronomical Society....10
- American Chemical Society....57
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- American Institute of Aeronautics and Astronautics....9
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- American Institute of Chemists....2
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- American Nuclear Society....3
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- American Society of Composers, Authors & Publishers....3
- American Society of Mechanical Engineers..7
- American Sociological Association....1
- American Thoracic Society (Edward Livingston Trudeau Medal)....1
- Arthur C. Cope Scholar Award....1
- Association of American Physicians....2
- Association for Computing Machinery....1
- Balzan....2
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- Chancellor's Medal....2
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- Charles E. Molnar Award....1
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- International Union of Radio Scientists....1
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University of California, San Diego

UCSD

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Parking Permit Dispenser
Change Machine
Stuart Collection
Campus Loop

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Torrey Pines Center South
John Jay Hopkins Dr.
Genesee Avenue
Science Center Drive
North Point Drive
North Point Lane
Torrey Pines Scenic Dr.
Scholars Drive North
Visitor Information Center
North Campus Recreation Area
North Campus
Hopkins Drive
Salk Institute Road
Eleanor Roosevelt College
Institute of the Americas
Thurgood Marshall
Supercomputer Center
Fitness Par Course
North Torrey Pines Road
Pangea Drive
Extended Studies & Public Programs
Marshall College Field
Thurgood Marshall College
Scholars Drive North
Voigt Drive
Equality Lane
Warren College
Justice Lane
Campus Services Complex
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University Center
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Almahurst Row
Canyonview Aquatics & Activities Center
Matthews Lane
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Lyman Lane
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Russell Lane
Sixth College
Gilman Drive
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Scholars Lane
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School of Medicine
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397 CRL — Center for Research in Language, Cognitive Science Building D7
453 CUSMS — Center for U.S.–Mexican Studies, Institute of the Americas Building C4
600 CWC — Center for Wireless Communications, Engineering-I F6
866 Cancer Center Administration, Guava F11
967 Cancer Research Facility (303 University Center) F9
801 Cellular and Molecular Medicine, CMM West D10
114 Chemistry and Biochemistry Department, Urey Hall Addition C10
397 Cognitive Science Department, Cognitive Science Building D7
390 Communication Department, Media Center/Communication Building C7
249 Computer Science and Engineering Department, Applied Physics and Mathematics Building C8
370 Economics Department, Economics Building C6
600 Electrical and Computer Engineering Department, Engineering-I F6
490 Ethnic Studies Department, Social Sciences Building C5
860 Family and Preventive Medicine Department, Date F11
250 History Department, Humanities and Social Sciences Building ..C8
801 Howard Hughes Medical Institute, CMM West D10
463 IGCC — Institute for Global Conflict and Cooperation, Robinson Building Complex ...C5
820 IMM — Institute for Molecular Medicine, Basic Science Building F10
397 INC — Institute for Neural Computation, Cognitive Science Building D7
620 INLS — Institute for Nonlinear Science, CMRR F7
113 IPAPS — Institute for Pure and Applied Physical Sciences, Urey Hall C10
463 International Relations and Pacific Studies (IR/PS), Graduate School of, Robinson Building Complex .C5
600 Jacobs School of Engineering, Engineering-I F6
726 LCHC — Laboratory for Comparative Human Cognition (517 University Center, 2nd floor) G8
246 Linguistics Department, McGill Hall C8
627 Literature Department, Literature Building G7
249 Mathematics Department, Applied Physics and Mathematics Building C8
610 Mechanical and Aerospace Engineering Department, Engineering-II G7
856 Molecular Medicine, School of Medicine Building 4 .....G10
285 Music Department, Mandeville Center D9
114 Natural Sciences, Dean's Office, Urey Hall Addition C10
855 Neurosciences Department, School of Medicine Building 1 .G10
820 Pathology Department, Basic Science Building F10
820 Pharmacology Department, Basic Science Building F10
250 Philosophy Department, Humanities and Social Sciences Building C8
114 Physical Sciences, Dean's Office, Urey Hall Addition C10
114 Physics Department, Urey Hall Addition C10
490 Political Science Department, Social Sciences Building C5
820 Psychiatry Department, Basic Science Building F10
246 Psychology Department, McGill Hall C8
481 San Diego Supercomputer Center D5
985 School of Pharmacy (202 University Center) E9
490 Sociology Department, Social Sciences Building C5
843 Stein Institute for Research on Aging, Stein Clinical Research Building G10
930 Structural Engineering Department, Science and Engineering Research Facility (SERF) F8
726 Teacher Education Program (517 University Center) G8
141 Theatre and Dance Department, Galbraith Hall ...C11
490 Urban Studies and Planning, Social Sciences Building C5
285 Visual Arts Department, Mandeville Center D9
930 WIBE — Whitaker Institute for Biomedical Engineering, Science and Engineering Research Facility (SERF) F8

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970 Chancellor (107 University Center) E8
627 Dean, Arts and Humanities, Literature Building G7
114 Dean, Biological Sciences, Urey Hall Addition C10
600 Dean, Jacobs School of Engineering, Engineering-I F6
949 Dean, Management School Administration (412 University Center) F8
820 Dean, School of Medicine, Basic Science Building/ Administrative Wing F10
490 Dean, Social Sciences, Social Sciences Building C5
325 Dean, University Extension, UCSD Extended Studies and Public Programs Complex B6
440 Provost, Eleanor Roosevelt College, ERC Administration (412 University Center) B4
250 Provost, Muir College, Humanities and Social Sciences Building ..C8
149 Provost, Revelle College, Revelle College Administration Building D11
965 Provost, Sixth College, Sixth College Administration Building (700 University Center) F9
360 Provost, Thurgood Marshall College, TMC Administration Building C7
627 Provost, Warren College, Literature Building G7
970 Senior Vice Chancellor, Academic Affairs (105 University Center) E8
970 Vice Chancellor, Business Affairs (110 University Center) .E8
970 Vice Chancellor, External Relations (108B University Center) E8
820 Vice Chancellor, Health Sciences, Basic Science Building F10
970 Vice Chancellor, Research (105 University Center) E8
970 Vice Chancellor, Resource Management and Planning (109 University Center) E8
970 Vice Chancellor, Student Affairs (112 University Center) E8

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640 Canyon Vista G5
161 Che Cafe D12
857 Club Med F10
640 Earl's Place G5
225 El Mercado B8
270 Faculty Club, Ida and Cecil Green D8
293 Food Co-op, Student Center ...D9
911 Food Court, Price Center E8
293 Grove Caffe, Student Center ...D9
225 Muir Woods, Stuart Commons ..B8
305 OceanView Terrace B6
225 P.O.P. (Muir Sundry Store), Stuart Commons B8
127 Plaza Cafe, Revelle Commons C11
293 Porter's Pub, Student Center ...D9
225 Sequoia Room, Stuart Commons B8
225 Sierra Summit, Stuart Commons B8
127 Why Not Here?, Revelle Commons C11

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900 Art and Architecture, Geisel Library E7
821 Biomedical Library E10
141 Center for Library and Instructional Computing Services (CLICS), Galbraith Hall C11
900 Geisel Library E7
463 International Relations and Pacific Studies Library C5
900 Science and Engineering, Geisel Library E7

Student and Visitor Services

940 Academic Enrichment Program (411 University Center) F8
725 Admissions — Graduate (520 University Center) G8
830 Admissions — School of Medicine, Medical Teaching Facility F10
960 Admissions — Undergraduate (301 University Center) F9
985 Alumni Relations (202 University Center) E9
627 Academic Internship Program, Literature Building G7
911 Associated Students, Price Center E8
911 Bookstore, UCSD, Price Center E8
911 Box Office, Price Center E8
911 Campus Tours, Price Center ...E8
950 Cashier (401 University Center) F9
225 Cloud's Rest Commuter Lounge, Stuart Commons B8
650 Commuter Computer Shuttle Stop, Student Activities Center G6
249 Computing Services, Academic, Applied Physics and Mathematics Building C8
970 Conference Room 111A (111 University Center) E8
386 Conference Services, Fireside Lounge D6
861 Continuing Medical Education, Evergreen F11
292 Crafts Center C9
720 Cross Cultural Center G8
500 Employment, Staff, Torrey Pines Center South B2
995 Employment, Student, Career Services Center E8
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830 Financial Aid — School of Medicine, Medical Teaching Facility F10
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820 Garren Auditorium, Basic Science Building F10
293 General Store, Student Center .D9
225 Glacier Point Lounge, Stuart Commons B8
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725 Graduate Studies and Research Office (520 University Center, 2nd floor) G8
293 Groundwork Books, Student Center D9
293 Guardian Student Newspaper, Student Center D9
225 Half Dome Conference Room, Stuart Commons B8
962 Housing, On-campus (310 University Center) F9
500 Human Resources, Torrey Pines Center South B2
911 Imprints (Copier Services), Price Center E8
325 ICL — Institute for Continued Learning, UCSD Extended Studies and Public Programs Complex B6
640 J.K. Wood Lounge, Canyon Vista Administration Building G5
299 Judicial Affairs, Student Center, Building B D9
293 KSDT Office, Student Center ..D9
820 Liebow Auditorium, Basic Science Building F10
985 Lesbian, Gay, Bisexual, Transgender (LGBT) Resource Office (201 University Center) ..E9
225 M.O.M. (Muir College Center), Stuart Commons B8
210 Mandeville Suite, Tioga Hall ...B8
980 OASIS — Office of Academic Support and Instructional Services, Center Hall E9
305 OceanView Lounge B6
293 Off Campus Housing, Student Center D9
820 Office of Learning Resources, Basic Science Building F10
392 Ombuds Office D7
719 Outback Adventures G8
783 Parking / Rideshare Office (Gilman Parking Structure) G9
920 Police (500 University Center) ..F8
911 Post Office, Price Center E8
141 Psychological and Counseling Services, Galbraith Hall C11
731 Recreation Office, Canyonview Aquatics and Activities Center ..H7
960 Registrar (301 University Center) F9
985 Religious Affairs, Office of E9
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113 Revelle Bargain Books, Urey Hall C10
123 Revelle College Center, Blake Hall C10
123 Revelle Commuter Lounge, Blake Hall C10
127 Revelle Conference Rooms, Revelle Commons C11
985 Student Account and University Billing Services (SAUBS) (201 University Center) E9
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299 Student Educational Advancement, Student Center, Building B D9
911 Student Information (EDNA), Price Center E8
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985 Students with Disabilities, Office for (202 University Center) E9
325 Summer Session, UCSD Extended Studies and Public Programs Complex B6
375 Thurgood Marshall Activities Center (TMAC) C6
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293 UCSD Bike Shop, Student Center D9
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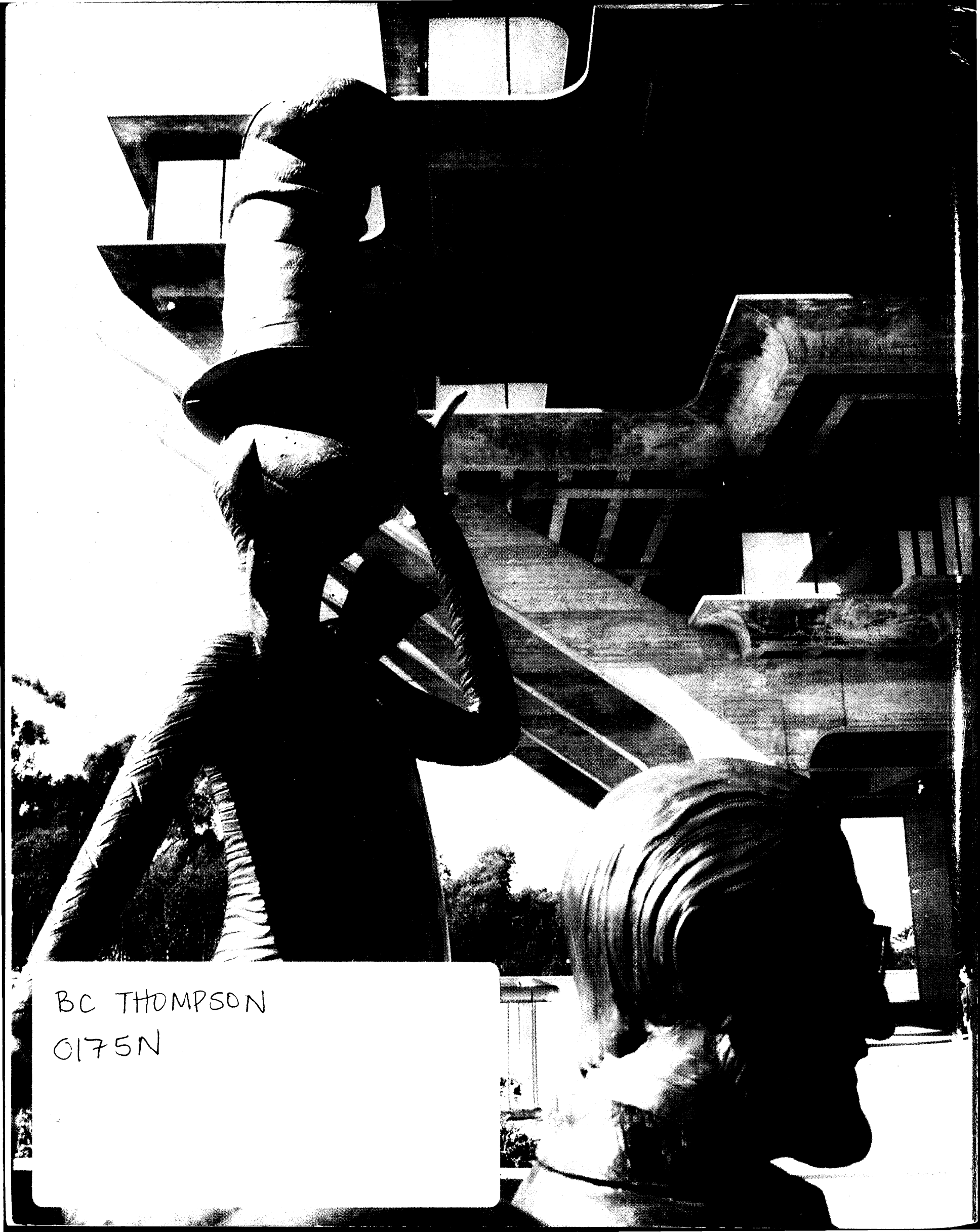
880 Visitor Information Center, Gilman Entrance E11
560 Visitor Information Center, North Point Entrance C3
946 Women's Center (407 University Center) F8
640 Yosemite Room, Canyon Vista Administration Building G5



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